

PHYTOLOGIA

*An international journal to expedite plant systematic, phytogeographical
and ecological publication*

Vol. 73

July 1992

No. 1

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Published by Michael J. Warnock
185 Westridge Drive Huntsville, Texas 77340 U.S.A.
PHYTOLOGIA is printed on acid free paper.

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PHYTOLOGIA (ISSN 00319430) is published monthly with two volumes per year by Michael J. Warnock, 185 Westridge Drive, Huntsville, TX 77340. Second Class postage at Huntsville, TX. Copyright ©1991 by PHYTOLOGIA. Annual domestic individual subscription (12 issues): \$36.00. Annual domestic institutional subscription (12 issues): \$40.00. Foreign and/or airmail postage extra. Single copy sales: Current issue and back issues volume 67 to present, \$3.50; Back issues (previous to volume 67), \$3.00 (add \$.50 per copy postage and handling US [\$1.00 per copy foreign]). Back issue sales by volume: \$17.00 per volume 42-66 (not all available as complete volumes); \$21.00 per volume 67-present; add \$2.00 per volume postage US (\$4.00 per volume foreign). POSTMASTER: Send address changes to Phytologia, 185 Westridge Drive, Huntsville, TX 77340.

SEP 21 1992

Phytologia (July 1992) 73(1):1-2.NEW YORK
BOTANICAL GARDEN

A NEW SPECIES OF *PERYMENIUM* (ASTERACEAE - HELIANTHEAE)
FROM MICHOACAN, MEXICO

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ABSTRACT

A new species, *Perymenium paneroi* B. Turner is described from Michoacán, México. It superficially resembles *P. hintonii* McVaugh, but is readily separated by a combination of features including pilose stems (vs. strigose), leaves with softly pilose undersurfaces (vs. hispid-scabrous), more numerous disk florets (30-40 vs. 15-20) with smaller achenes (2-3 mm long vs. 3-5 mm).

KEY WORDS: Asteraceae, *Perymenium*, México

Preparation of a treatment of *Perymenium* for a forthcoming text on the Asteraceae of México has been continually bedeviled by the discovery of new taxa by a bevy of recent Mexican collectors. Thus, since the revisional study of *Perymenium* by Fay (1978) six new taxa have been added to the genus by my studies, and additional taxa await description. Fay recognized 33 species of *Perymenium* as occurring in México. The present description brings the total to about 40.

Perymenium paneroi B. Turner, *sp. nov.* TYPE: MEXICO. Michoacán: 4-5 km S of Zitacuaro-Ciudad Hidalgo highway on road to Jungapeo. Shrubs 3 m high, "Growing along the road in remnants of tropical deciduous forest including *Montanoa speciosa* and *Viguiera puruana*. Only one plant seen.", 8 Oct 1991, José L. Panero 2410 (HOLOTYPE: MEXU!; Isotype: TEX!).

Perymenio hintonii McVaugh similis sed differt caulibus pilosis (vs. strigosis), foliorum paginis inferis molliter pilosis (vs. hispidi-scabris), flosculis discii numerosioribus (30-40 vs. 15-20), et acheniis minoribus (2-3 mm longis vs. 3-5 mm).

Erect shrubs to 3 m high. Stems more or less terete or 4 sided, densely pilose with spreading hairs, the latter 0.50-0.75 mm long. Midstem leaves mostly 8-17 cm long, 2.5-7.5 cm wide, somewhat bicolored; petioles 1.5-3.5 cm long; blades broadly ovate to cordate, 3-5 nervate from or near the base, moderately pilose above with erect scabrid hairs, densely pilose-sericeous below with soft hairs, the margins serrulate. Heads terminal, arranged 5-15 in a congested corymbose panicle, the ultimate peduncles mostly 3-12 mm long. Involucres campanulate, 6-7 mm high, 6-7 mm wide, the bracts 3-4 seriate, unevenly graduate, the 2 inner series ampliate and scarious apically, not grading into the receptacular bracts, the outer 2 series shorter, strigillose, with margins ciliate. Receptacle convex, ca. 3 mm across; the chaff ca. 4 mm long. Ray florets 5-8, pistillate, fertile, the ligules golden-yellow ca. 4 mm long. Disk florets 30-40, the corollas golden-yellow, ca. 5 mm long, the tube ca. 1.5 mm long, the throat abruptly ampliate, glabrous, ca. 2 mm long, the lobes minutely hispidulous. Anthers black. Style appendages acuminate. Achenes 2.5-3.0 mm long, minutely transversely rugose, ovoid on cross-section, the pappus of numerous ciliate bristles 0.5-2.0 mm long.

Perymenium paneroi superficially resembles *P. hintonii* McVaugh, which is currently known by only four collections from easternmost México State and closely adjacent Michoacán, apparently occurring from 700-1000 meters, mostly in pine forests. It differs from *P. hintonii* in possessing densely pilose stems (vs. strigose), leaves with hispid-scabrid undersurfaces (vs. softly pilose), more numerous heads with more numerous disk florets (30-40 vs. 15-20), and smaller disk achenes (2-3 mm long vs. 3-5 mm) with mostly shorter pappus bristles (0.5-2.0 mm long vs. 35 mm).

ACKNOWLEDGMENTS

I am grateful to José Panero for calling this novelty to my attention. Guy Nesom kindly provided the Latin diagnosis and reviewed the manuscript, as did José Panero.

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A NEW SPECIES OF *DENDROBIUM* SW., SECTION *DENDROCORYNE*
(ORCHIDACEAE) FROM AUSTRALIA

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ABSTRACT

A new species of *Dendrobium* Sw. is described for the forthcoming orchid volume of the *Flora of Australia*.

KEY WORDS: *Dendrobium*, Queensland, Australia, Orchidaceae

INTRODUCTION

The genus *Dendrobium* in Australia comprises about 60 species distributed mainly in northeastern Queensland (Clements 1989). A new species which has affinities with *D. fleckeri* Rupp & C. White is described here as new.

Dendrobium finniganense D. Jones, *species nova*. TYPUS: AUSTRALIA. Queensland: Cook District: cultivated Australian National Botanic Gardens, ex Mt. Finnigan, *L. Roberts s.n.* (*L. Lawler 66*), 31 January 1992 (HOLOTYPE: CBG; Isotypus: BRI).

Species nova affinis *D. fleckeri* Rupp & C. White a qua floribus majoribus graveolentibus; pedunculo longiore; sepalo dorsali latiore; petalis elliptico-lanceolatis latioribus; et labello majore lobis lateralibus brevioribus minus acuminatis, differt.

Terrestrial or lithophyte forming extensive branched clumps with numerous aerial growths. Pseudobulbs 2-24 cm x 3-4 mm, linear-terete, attenuate, shallowly sulcate, pale green to yellow, swollen at base then narrowed, slightly widening just near middle; nodes 3-7. Leaves 1-3, apical, 5-8 cm x 1.6-2.0 cm, elliptical to elliptical lanceolate, dark green, thinly coriaceous, porrect,

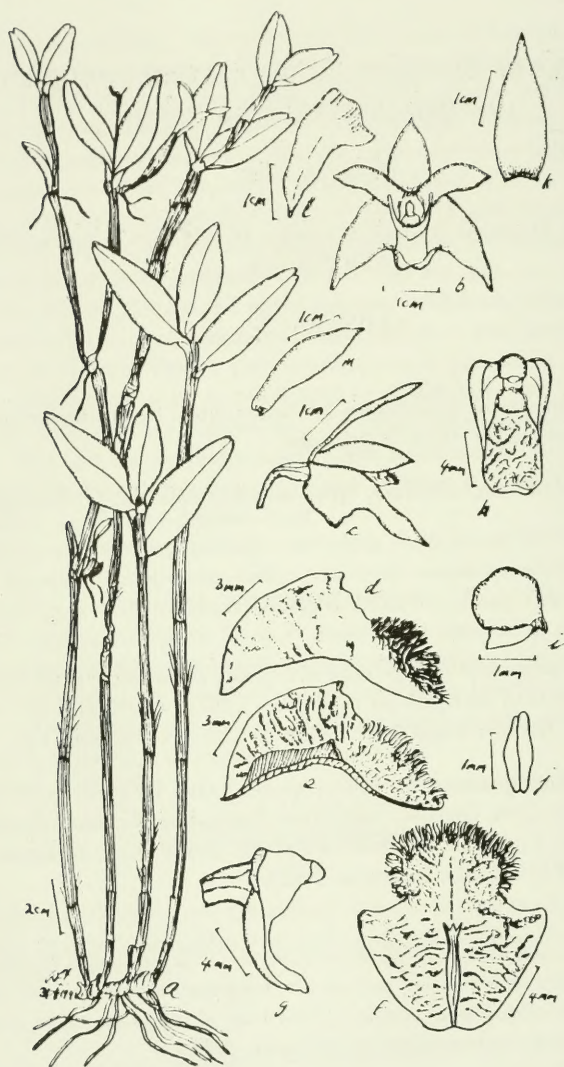


Figure 1. *Dendrobium finniganense*, Mt. Finnigan, L. Lawler 66; a. plant; b. flower from front; c. flower from side; d. labellum from side; e. longitudinal section of labellum; f. labellum from above flattened out; g. column from side; h. column from front; i. anther cap from side; j. two pollinia; k. dorsal sepal flattened out; l. lateral sepal flattened out; m. petal flattened out. All figures to indicated scale.

apex unequally emarginate. Inflorescence solitary, terminal, each bearing 1 or 2 flowers. Peduncle 3.0-4.5 cm long, erect. Floral bracts 3-5 mm x 1.5 mm, linear-ovate, acuminate, sheathing base of pedicel. Pedicel 10-14 mm long, expanding gradually into the ovary. Ovary 3-4 mm long, green. Flowers 26-34 mm across, cream to white, yellowish and purple marked near the centre, expanding widely, strongly fragrant. Dorsal sepal obliquely erect, 22-26 mm x 8-9 mm, ovate-lanceolate, thick and fleshy, tapered to an acute to acuminate apex, mainly cream to white, yellowish at base with fine purple striae. Lateral sepals 24-26 mm x 12-14 mm, lanceolate, broadest near base, thick and fleshy, saccate and connate in proximal ventral quarter, falcate, apex subacute, cream to white, yellowish at base with fine purple striae. Petals porrect or spreading, 20-22 mm x 4-5 mm, linear to linear oblanceolate, falcate, acute to acuminate, cream to white, yellowish at base. Labellum obliquely erect at base then curved through 60°, 13-15 mm x 12-13 mm when flattened, trilobed; lateral lobes erect, ca. 8 mm x 5 mm, more or less triangular, cream, irregularly and heavily barred with purple, margins entire; midlobe ca. 6 mm x 10 mm, more or less orbicular, broadly obtuse, margins and dorsal surface densely beset with transparent, glandular trichomes ca. 1 mm long, a few purple markings also present; callus of a single, narrow, raised, central yellow ridge restricted to the proximal half of the labellum, apex trilobed, three vague ridges extending along the midlobe nearly to the apex. Column ca. 4 mm long, projected forward from the end of the ovary. Column foot ca. 8 mm x 4.5 mm, curved, anterior surface heavily marked with purple. Anther ca. 2 mm x 1.2 mm, with a short, projecting, laciniate rostrum. Stigma ca. 2 mm across, obovate-rectangular, sunken. Pollinarium ca. 1.5 mm x 1 mm, ellipsoid, orange-yellow, waxy. Capsule not seen.

Specimens Examined: Thornton's Peak, December 1990, ANZAAS Expedition (CBG).

Distribution and Habitat: Restricted to northeastern Queensland where known with certainty from Mts. Finnigan, Pieter Botte (L. Roberts pers. comm.) and Thornton's Peak; possibly also occurring on adjacent peaks. This species grows as a terrestrial or lithophyte at high elevations (about 1100 m altitude) in open exposed sites among rocks and boulders.

Flowering Period: November to January.

Affinities: *Dendrobium finniganense* has affinities with both *D. adae* Bailey and *D. fleckeri*. It can be distinguished from *D. adae* by its much larger flowers, broader dorsal sepal, broader, triangular lateral lobes on the labellum and the densely hairy midlobe to the labellum. From *D. fleckeri* it can be distinguished by its larger, strongly scented white flowers on a longer peduncle, broader dorsal sepal, broader elliptical-lanceolate petals and a larger labellum with shorter, acuminate lateral lobes. Plants of *D. finniganense* grow larger than the other two species (a single clump may be more than 90 cm across and consist of more than sixty stems) and is also more prolific in the production

of aerial growths, resulting in a mass of aerals growing on aerals.

All three species occur on Mts. Finnigan and Pieter Botte and Thornton's Peak, but are separated by altitude and or habitat and hybrids are unknown (L. Lawler and L. Roberts pers. comm.). The new species occupies the mountain summits growing in open situations and, whereas *Dendrobium fleckeri* grows at the same altitude, it is found in shaded situations in rainforest. *Dendrobium adae* grows at lower altitudes than both of these species.

Notes: *Dendrobium finniganense* produces aerial growths copiously and colonises adjacent sites by this method of vegetative reproduction.

Conservation Status: *Dendrobium finniganense* is locally common, conserved in the Mt. Finnigan National Park and is not threatened.

Etymology: In reference to the type locality of Mt. Finnigan.

ACKNOWLEDGMENTS

I wish to thank Lewis Roberts for collecting the original material and Len Lawler for bringing it to my attention and for numerous discussions about the species. I also thank Mark Clements for reading the manuscript, Corinna Broers for technical assistance and Alex George for supplying the Latin diagnosis.

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**COREOPSIS MUTICA VAR. GUERREROANA (ASTERACEAE), A NEW
TAXON FROM MEXICO**

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ABSTRACT

A new variety, *Coreopsis mutica* var. *guerreroana* is described from Guerrero, México. It is distinguished by its solitary heads on short peduncles, and small, thin, subentire leaves. An overview to all of the varieties of this complex is provided, along with a key to taxa, nomenclatural notes, and a map showing their distribution.

KEY WORDS: Asteraceae, *Coreopsis*, México

Routine identification of Mexican Asteraceae has revealed the following novelty.

***Coreopsis mutica* A. DC. var. *guerreroana* B. Turner, var. nov.** TYPE: MEXICO. Guerrero: 6 km E of Chatacachapa (a village between Chilapa and Tixtla along the road to Chilpancingo), 4 Sep 1991, José L. Panero 2281 (HOLOTYPE: MEXU!; Isotypes: MICH!, TEX!, US!).

Coreopsi muticae A. DC. var. *subvillosae* A. DC. similis sed caulibus ac foliis glabris, foliis tenuibus minoribus (plerumque 4.5-5.5 cm longis vs. 6-8 cm) subintegrisque, et capitulis solitariis differt.

Low suffruticose shrublets. Leaves mostly 4.5-5.5 cm long, 1.3-1.5 cm wide; petioles 4-10 mm long; blades narrowly elliptic, glabrous or nearly so. Heads solitary, the peduncles 1.0-1.5 cm long. Ray florets 8, the ligules 12-16 mm long, 5-7 mm wide. Disk florets ca. 20. Stamens purplish. Achenes elliptic to ovoid, 6-7 mm long, ca. 3 mm wide, glabrous, epappose.

Crawford (1970) provided an excellent study of the *Coreopsis mutica* complex, recognizing seven regional varieties. In 1981, he added an additional taxon, var. *simplicifolia* D. Crawford. The latter falls under my concept of *C.*

mutica var. *mutica*; additionally, Crawford also recognized the var. *leptomera* Sherff, which I also include in synonymy under var. *mutica*, as discussed below.

KEY TO THE *C. MUTICA* COMPLEX

1. Leaves thin, simple, entire or subentire; Guerrero. var. *guerreroana*
1. Leaves thick, subentire to 3 parted, mostly to some extent serrate; not in Guerrero. (2)
 2. Mature leaves densely and evenly hispidulo-puberulous above and below; southeastern Puebla. var. *holotricha*
 2. Mature leaves glabrous or subglabrous. (3)
3. New axillary stem growth and foliage densely subvillous, at maturity glabrate to subglabrate; central and northern Oaxaca. .. var. *subvillosa*
3. New axillary stem growth and foliage glabrous or merely sparsely sordid puberulent. (4)
 4. Heads solitary and terminal, hemispheric, involucre at maturity 2.0-2.5 cm across; se Oaxaca. var. *multiligulata*
 4. Heads borne 3-30 in terminal subfasciculate cymes, broadly turbinate to campanulate, involucre at maturity mostly 1-2 cm across. . (5)
5. Heads mostly 1-2 cm across the expanded rays; capitulescence mostly of numerous heads (20-60) arranged in rather flat topped cymose panicles; Chiapas and easternmost Oaxaca. var. *microcephala*
5. Heads mostly 2-4 cm across the expanded rays; capitulescence of mostly 1-10 heads in open or congested cymes. (6)
 6. Leaves, or their divisions, ovate, widest well below the middle; Guanajuato, Querétaro, Hidalgo, México State and n Puebla. var. *mutica*
 6. Leaves, or their divisions, elliptic, widest at or near the middle; s Puebla, Guerrero, and Oaxaca. var. *carnosifolia*

Coreopsis mutica A. DC. var. *carnosifolia* Crawford

This taxon is a relatively common shrub (1-3 m high) along highway 190 between Cd. Oaxaca and Tehuantepec, mostly occurring in pine-oak forests or semixerix woodlands between 1000-2100 meters. According to Crawford (1970) it is polyploid with $2n = \text{ca. } 112$. Var. *carnosifolia* is largely recognized by its relatively few large heads, and apparently grades into the mostly allopatric varieties *subvillosa* and *microcephala*, as discussed below.

Coreopsis mutica A. DC. var. *holotricha* (S.F. Blake) S.F. Blake

Because of its small, usually 3 parted leaves and uniformly pubescent, markedly persistent, vestiture, this is the most readily distinguished taxon of the *Coreopsis mutica* complex. Known to Crawford (1970) only by the type, several additional collections, all from southern Puebla (*Tenorio* 594, 7646, 12113, TEX), have come to the fore. Label data describe the taxon as a low shrub or suffrutescent subshrub 0.4-1.5 meters high, said to be abundant in places and occurring in xeric shrublands from 1800-2300 meters. I detect no intergradation of this taxon with yet other members of the *C. mutica* complex.

Coreopsis mutica A. DC. var. *microcephala* Crawford

This is a common shrub in Chiapas and Guatemala, extending eastward into Honduras and El Salvador, and westward near the border regions into Oaxaca. For the most part it is readily distinguished from the largely allopatric var. *carnosifolia* by its smaller, more numerous heads, and persistently pubescent foliage (the vestiture usually persisting along the major veins on the under side of leaves). Nevertheless, the two varieties appear to intergrade along the Oaxaca-Chiapas border regions as deduced from the following intermediates (Oaxaca: *Trigos* 2262, [TEX] 19 km SW of San Juan Juguila; and Chiapas: *Breedlove* 28896, [TEX] 30 km NW of Ocozocoautla).

According to Crawford (1970), a chromosome count of $2n = 56$ has been determined for this taxon (vs. $2n = \text{ca. } 112$ in var. *carnosifolia*).

Coreopsis mutica A. DC. var. *mutica*, *Prodr.* 5:571. 1836.*Coreopsis mexicana* A. DC. var. *mexicana*.*Coreopsis mutica* A. DC. var. *leptomera* Sherff*Coreopsis mutica* A. DC. var. *simplicifolia* Crawford*Electra mexicana* (A. DC.) Hemsl.

Crawford (1970, 1981) treated var. *leptomera* and var. *simplicifolia* as distinct from var. *mutica*, relegating *Coreopsis mexicana* to synonymy under var. *leptomera* (if the latter taxon is accepted, sensu Crawford, then the correct name for this variety would be *C. mutica* var. *mexicana*, the latter varietal name being established with the publication of *C. mexicana* (A. DC.) Hemsl. var. *hyperdasya* S.F. Blake. I cannot find sufficient geomorphological evidence to distinguish among these.

The type of *Coreopsis mutica* var. *mutica* (Tlapujahua, Keerl s.n., BR), if correct, is from the state of Michoacán. According to Shinners (1946, p. 117), Keerl's "Tlapujahua" is doubtless the modern town of Tlapujahua in Michoacán." However, Crawford (1970, 1981) maps var. *mutica* as occurring only in the state of Hidalgo. While *Coreopsis mutica* var. *mutica* is seemingly a very distinct taxon, readily distinguished from its more southern cohorts by its largely ovate leaves or leaflets, I cannot distinguish infraspecific categories under this wide ranging variable complex.

The type of var. *mexicana* is from the state of Guanajuato, near Villalpando beyond Cd. Guanajuato (Mendez s.n., Isotype: GH). The type of var. *leptomera* Sherff is from eastern Hidalgo (Pringle 9895, HOLOTYPE: F). Crawford mapped var. *mexicana* (i.e., his var. *leptomera*) as occurring in Guanajuato, Querétaro, western Hidalgo, and western México State. Crawford distinguished his var. *leptomera* from var. *mutica* by its 3 parted leaves ("except in Guanajuato plants") vs. leaves simple, lobed, or 3 parted, all types occurring on the same plant. Examination of a wide range of collections show that leaf shape is exceedingly variable in the group, as may be inferred from Crawford's rather difficult couplet to distinguish between these.

Crawford (1981) described the var. *simplicifolia*, comparing this with var. *leptomera*. He based his assessment of var. *simplicifolia* upon four collections of simple leaved variants occurring in the vicinity of Cd. Guanajuato, which is also the immediate area from which the type of var. *mexicana* was obtained. According to Crawford (1981), "leaf flavonoid chemistry clearly distinguishes var. *leptomera* and the [simple leaved] plants from Guanajuato." Additionally, a single chromosome count of the simple leaved variant revealed a count of $2n = 56$, the same as reported for his var. *leptomera*. Crawford (1981, Fig. 2) showed the distribution of var. *simplicifolia* to be confined to the vicinity of Guanajuato, that of var. *mutica* to Querétaro, western Hidalgo, and the western state of México, but as noted in the above, the type of var. *mexicana* (the earliest available name for Crawford's concept of var. *leptomera*) is from near Cd. Guanajuato. The type of var. *leptomera* is from Hidalgo. In my opinion, however, as shown in Fig. 1, the var. *mutica* seems best treated as a single, widespread, highly variable taxon until more definitive studies are done. If Crawford's infraspecific delineation of this complex is accepted the following names would apply: var. *mexicana* to populations about Guanajuato, var. *mutica* to populations occurring in Querétaro, western Hidalgo and western

México; material referred by him to "var. *mutica*" from southeasternmost Hidalgo, if recognized, does not have a varietal name. In short, on present data, it would seem best to recognize but a single variable taxon, var. *mutica* with variable foliage, flavonoids and chromosome numbers ($2n = 56$ and 112), at least until additional populations are studied in more detail.

Coreopsis mutica A. DC. var. *multiligulata* Crawford

This variety is known by only two collections, both obtained from along Highway 190 ca. 42 km W of Tehuantepec, Oaxaca. It is readily distinguished from the closely allopatric (if not sympatric) varieties *microcephala* and *carosifolia* by its large single heads with 8-11 ray florets. In total characters, however, it seems closest to the var. *carosifolia*, possessing the glabrous foliage and relatively few headed capitulescence of that taxon.

According to Crawford, var. *carosifolia* has a chromosome count of $2n = 112$ while var. *multiligulata* has a count of $2n = 56$.

Coreopsis mutica A. DC. var. *subvillosa* A. DC.

Coreopsis galeottii (A. Gray) Hemsl.

Coreopsis mexicana (A. DC.) Hemsl. var. *hyperdasys* S.F. Blake forma *hyperdasys*

item index *Electra galeottii* *Electra galeottii* A. Gray

This is an extremely variable taxon and is largely recognized by its relatively large heads and subvillose vestiture. It apparently grades into var. *carosifolia* in the southern portion of its range (e.g., Turner 80A-9 TEX; 35 mi E of Ejutla, Oaxaca). I have obtained a count of $2n = \text{ca. } 84$ or $n = \text{ca. } 42$ pairs for this taxon (Turner 0-36, TEX); this is an apparent hexaploid, assuming an ancestral base number of $x = 14$, as suggested by Crawford (1981, 1982). Specimens collected along the Oaxaca-Puebla border (e.g., Oaxaca: Cronquist 10404 TEX; Puebla: Tenorio 7339 TEX) are relatively more glabrous and appear to vary in the direction of var. *mutica* and these two specimens might be equally well positioned in the latter, possessing well defined lanceolate leaves or divisions thereof.

SUMMARY

With the description of *Coreopsis mutica* var. *guerreroana*, *C. mutica* is treated as having seven infraspecific taxa: var. *mutica* (including varieties *leptomera*, *mexicana*, and *simplicifolia*) of north central México; var. *guerreroana* from Guerrero; var. *holotricha* from southeastern Oaxaca; var. *subvillosa* from

COREOPSIS MUTICA

- var. *carosifolia*
- var. *guerreroana*
- △ var. *holotricha*
- var. *microcephala*
- ▲ var. *mutica*
- var. *multigulata*
- ▴ var. *subvillosa*

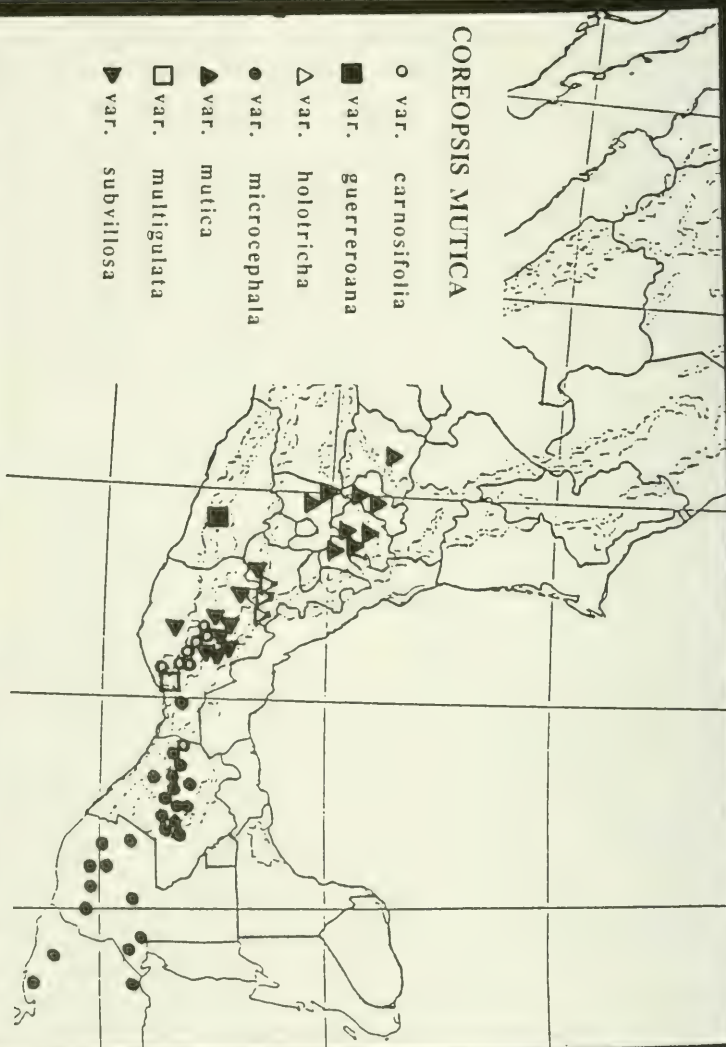


Fig. 1. Distribution of varieties of *Coreopsis mutica*.

central and northern Oaxaca and closely adjacent Puebla; var. *multiligulata*, a localized endemic of southeastern Oaxaca; var. *carnosifolia* from southeastern Oaxaca and closely adjacent Chiapas; and var. *microcephala*, a widespread taxon of easternmost Oaxaca, central Chiapas, extending through Guatemala to Honduras and El Salvador.

ACKNOWLEDGMENTS

I am grateful to Dr. José Panero for calling to my attention the material concerned; to Guy Nesom for the Latin diagnosis; and to him and Dan Crawford for reviewing the manuscript.

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**A NEW SPECIES OF *VERBESINA* (SECT. *PSEUDOMONTANO*) FROM
JALISCO, MEXICO**

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ABSTRACT

A new species, *Verbesina tecolotlana* B. Turner, is described from Jalisco, México. It belongs to the sect. *Pseudomontanoa* where it relates to *V. montanoifolia*; *V. tecolotlana* is distinguished from the latter in having a cylindric involucre (vs. turbocampanulate), a single ray floret (vs. 5-13) and 5-6 disk florets (vs. 12-40).

KEY WORDS: Asteraceae, *Verbesina*, México

Identification of Mexican Asteraceae has revealed the following novelty.

Verbesina tecolotlana B. Turner, *sp. nov.* TYPE: MEXICO. Jalisco: Mpio. Tecolotlán, "Faldas del Cerro Cuchilla, por ojo de Agua," tropical deciduous forests, 27 Aug 1991, A.L. Vazquez H. 14 (HOLOTYPE: TEX).

Verbesinae montanoifoliae B.L. Robins. & Greenm. similis sed differt involucris cylindraceis (vs. turbocampanulatis) bracteis flaviscariosis (vs. stramineis), flosculis radii 1 (vs. 5-13), et flosculis disci 5-6 (vs. 12-40).

Shrub or shrublet (?). Stems minutely hispidulous, winged, the wings 1-3 mm wide. Leaves opposite throughout, ca. 10 cm long, 6 cm wide; petioles 2.5 cm long, winged throughout, the wings 2-3 mm wide; blades deeply trilobed, the principal lobes again lobed, trinervate from or near the base, hispid-pilose beneath, especially along the venation, the upper surface coarsely hispid-scabrous with broad based hairs. Capitulescence a more or less flat topped densely packed corymbiform cyme of numerous heads, ca. 18 cm across, the ultimate peduncles mostly 3-8 mm long. Involucres 1-4 seriate, at anthesis

cylindric, ca. 2 mm across, ca. 6 mm high, the outer bracts 1-2 mm long, herbaceous, the remainder subgraduate, lanceolate to linear lanceolate, yellowish, subscarios, the apices mostly obtuse. Receptacle plane, ca. 0.6 mm across, paleate (in texture, color, and shape the pales like the involucral bracts). Ray florets 1 per head, pistillate, fertile, the ligules 3-5 mm long, ca. 2 mm wide. Disk florets 5 or 6 per head, the corollas glabrous, yellow, ca. 5 mm long, the tube ca. 1 mm long, the lobes ca. 0.75 mm long. Anthers black, the appendages yellow. Style branches with slender, gradually acuminate apices. Achenes (immature), both disk and ray, moderately pubescent, the pappus of 2 persistent awns 1.5-2.0 mm long.

This species belongs to the section *Pseudomontanoa* of *Verbesina* as delineated by Turner (1985). It appears most closely related to *V. montanoifolia* B.L. Robins. & Greenm., but differs in having cylindrical heads with a single ray floret (vs. 5-13, rarely 3) and only 5-6 disk florets (vs. 12-40). In addition, the leaves are deeply parted (vs. mostly not, or merely shallowly lobate) and the involucral bracts are yellowish scarious (vs. stramineous).

ACKNOWLEDGMENTS

I am grateful to Guy Nesom for the Latin diagnosis and to him and José L. Panero for reviewing the paper.

LITERATURE CITED

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A NEW SPECIES OF *VERNONIA* (ASTERACEAE) FROM SONORA, MEXICO

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ABSTRACT

A new species, *Vernonia joyaliae* B. Turner, is described from southern Sonora, México. It belongs to the section *Lepidaploa* (*Paniculatae verae*) of *Vernonia* where it relates to *V. faustiana* (Chapman & Jones) B. Turner.

KEY WORDS: Asteraceae, *Vernonia*, México, Sonora

Routine identification of Mexican Asteraceae has revealed the following novelty.

Vernonia joyaliae B. Turner, *sp. nov.* TYPE: MEXICO. Sonora: Rancho Santa Barbara, R. Cuchijaqui drainage, 27° 06.8' N, 108° 42.2' W, San Felipe Valley, along permanent creek with *Sabal*, ... *Vitex mollis*, with pine-oak forest above, 750-800 m, 17 May 1990, *Elaine Joyal 1465* [with A. Alvarez, C. Smith, & J. Rascon] (HOLOTYPE: ASU!).

Vernoniae faustianae (Chapman & Jones) B. Turner similis sed capitulescentia subfasciculata et bracteis involucri valde imbricatis in seriebus 6-8.

Perennial herb to 38 cm high. Stems densely pilose-tomentulose. Leaves alternate, 8-13 cm long, 2.5-3.6 cm wide; petioles 4-10 mm long, pubescent like the stems; blades elliptic-lanceolate, pinnately nervate, softly pilose above and below, densely so at first but with age glabrate, the margins minutely serrulate to entire. Heads 6, arranged in a stiffly erect subfasciculate cyme, the ultimate peduncles tomentulose, 2.5-4.5 cm long. Involucres broadly campanulate, 9-10 mm high, 12-14 mm wide, the bracts numerous, 6-8 seriate, evenly graduate, the apices rigid, acute. Receptacle plane. Florets 30-40 per head; corolla (only one present) purple, ca. 9 mm long. The lobes linear-lanceolate, ca. 3

mm long. Achenes cylindric, 8-10 ribbed, sparsely hispid-pilose, the pappus of ca. 40 persistent white inner bristles in a single row, these ca. 10 mm long, and on outer series of scales ca. 0.5 mm long.

Vernonia joyalae is a very distinct species, having no obvious close relations. It appears to belong to the section *Lepidaploa* (*Paniculatae verae*) of *Vernonia*, in which Chapman & Jones (1978) included four taxa. Among these, *Vernonia faustiana* appears to be nearest *V. joyalae*. They share similar habits, heads, and achenes, but the latter species has a much stricter, fewer headed capitulescence, and more markedly graduate involucre bracts.

It is a pleasure to name this plant for its primary collector, Elaine Joyal, collections manager at the Arizona State University herbarium.

ACKNOWLEDGMENTS

I am grateful to Guy Nesom for the Latin diagnosis and to him and T.P. Ramamoorthy for reviewing the manuscript.

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NEW SPECIES AND COMBINATIONS IN *HOFMEISTERIA* (ASTERACEAE, EUPATORIEAE)

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ABSTRACT

A new species, *Hofmeisteria gayleana* B. Turner, is described from the Sinaloa-Durango border along highway 40, and *H. urenifolia* (Hook. & Arn.) Walp. var. *mexiae* (B.L. Robins.) McVaugh is elevated to specific rank, *H. mexiae* (B.L. Robins.) B. Turner, *stat. et comb. nov.* Both species are related to *H. urenifolia* and a key to the complex is constructed, along with a map showing the distribution of critical taxa. An illustration of *H. gayleana* is also provided.

KEY WORDS: Asteraceae, Eupatorieae, *Hofmeisteria*, México

***Hofmeisteria gayleana* B. Turner, *sp. nov.* Fig. 1. TYPE: MEXICO.** Sinaloa: Mpio. Concordia, Potrerillos a La Peteca, bosque mesófilo en transición con bosque de pino-encino, suelo pedregoso, ca. 1600 m, 25 Feb 1990, *Rito Vega A. 3680* (HOLOTYPE: TEX!; Isotype: EACS).

Hofmeisteriae urenifoliae (Hook. & Arn.) Walp. similis sed capitulis majoribus, involucris 9-11 mm altis (vs. 5-7 mm), flosculis numerosioribus (400+ vs. 100-180), et ramis styli roseis (vs. albis) differt.

Perennial rhizomatous herbs 20-60 cm high. Stems erect to recumbent, moderately pilose with crisp hairs up to 3 mm long. Midstem leaves mostly 6-8 cm long, 3-4 cm wide; petioles 2-4 cm long; blades mostly 5-7 pinnatifid, the ultimate segments ovate in outline, the margins irregularly dentate. Heads (pressed) 12-15 mm high, 15-20 mm wide, solitary on minutely glandular pubescent peduncles up to 16 cm long. Involucres campanulate, the bracts numerous (80+) 5-6 seriate, graduate, the outermost elliptic-lanceolate, ca. 3

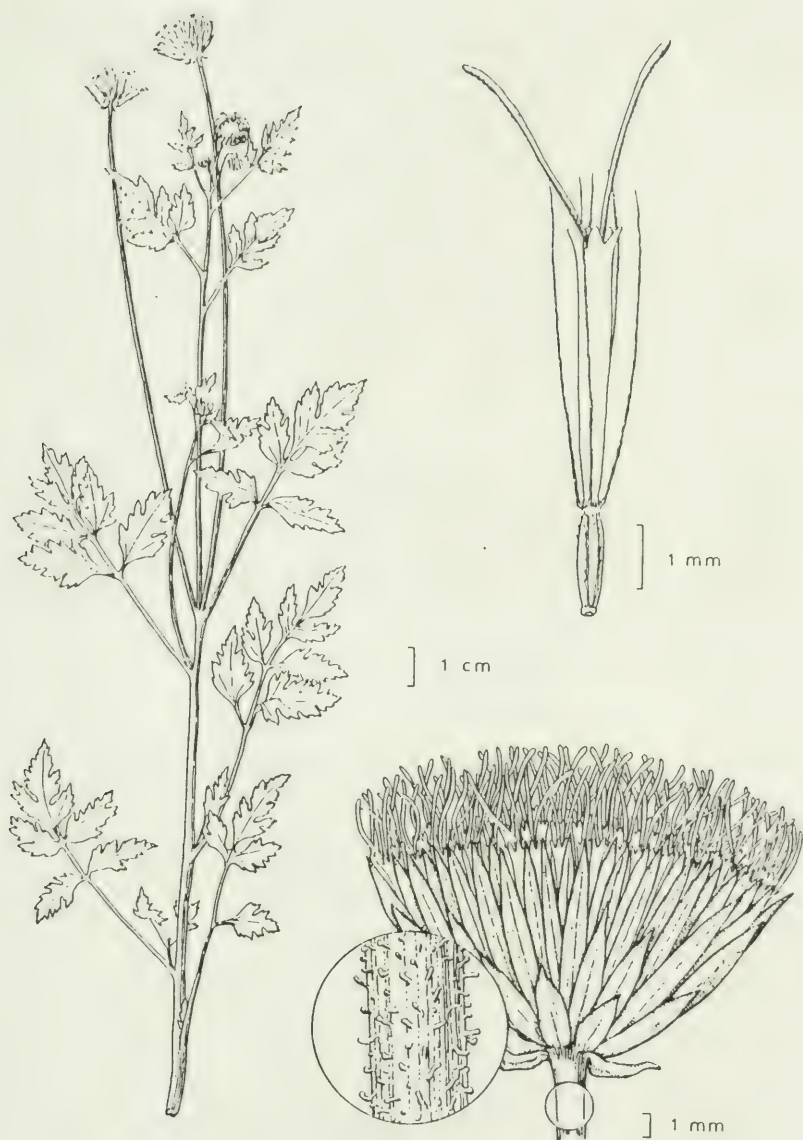


Fig. 1. *Hofmeisteria gayleana*, from holotype.

mm long, the innermost linear-lanceolate, ca. 10 mm long. Receptacle epaleate or nearly so, 4-5 mm across. Florets numerous (400+), the corollas tubular, pinkish white, ca. 5 mm long, the extended style branches rose colored. Anther appendages thin, ca. as wide as long. Achenes ca. 2 mm long, sparsely hispidulous, the pappus of 5 barbellate reddish bristles ca. 6 mm long.

ADDITIONAL SPECIMEN EXAMINED: MEXICO. Durango: ca. 60 mi SW of El Salto, 9.8 mi W of La Fraquita, pine-oak-subtropical vegetation, transition zone, in dripping wet habitats, 18 Mar 1982, *B.L. Turner & Gayle Turner 15070* (TEX).

I first became familiar with this plant in 1982, during a brief "botanical" honeymoon with my wife Gayle, in whose honor the species is named. Appropriately so, for the taxon is relatively rare, beautiful to behold, and largely confined to semicloud forests surrounded by exotic *Bocconia* trees and the pastel pinks of bromeliads. Our original collections were immature, but the more recent type collection (Fig. 1) leaves little doubt as to its distinctness.

Hofmeisteria gayleana is closely related to the widespread *H. urenifolia* from which it is readily distinguished by its much larger, rosy heads, with the involucre possessing 80 or more graduate bracts, the latter mostly 9-11 mm long (vs. 5-6 mm long), and the heads containing 400 or more florets (vs. 100-200). Since *Hofmeisteria urenifolia* and closely related species are difficult to distinguish, I have prepared the following key to help in identification:

Key to *H. urenifolia* and related taxa

1. Ultimate divisions of the leaves lanceolate in outline, mostly 2-5 mm wide, the apices mostly sharply acute. *H. schaffneri*
1. Ultimate divisions of the leaves oblanceolate, ovate elliptic, deltoid to cordate in outline, mostly 6-20 mm wide, if narrower the apices mostly broadly acute to obtuse, scarcely rigidly acute. (2)
 2. Heads (pressed) 10-15 mm high, ca. 20 mm wide; stylar appendages rose colored; Sinaloa-Durango border areas along highway 40. ...
..... *H. gayleana*
 2. Heads (pressed) 8-10 mm high, ca. 20 mm wide; stylar appendages white; widespread. (3)
3. Leaves dissected, the ultimate divisions narrowly oblanceolate to narrowly elliptic in outline; Sinaloa, Sierra Tacuichamona. *H. sinaloensis*
3. Leaves simple, broadly ovate to broadly elliptic in outline; Nayarit to Chiapas. (4)

4. Leaves ovate to ovate elliptic in outline; outermost bracts ovate; pappus bristles red; Sonora and Sinaloa. *H. standleyi*
4. Leaves deltoid to cordate in outline; outermost bracts linear-lanceolate; pappus bristles white; Nayarit and Jalisco. *H. mexiae*

Hofmeisteria mexiae (B.L. Robins.) B. Turner, *comb. & stat. nov.* BASIONYM: *Fleischmannia urenifolia* (Hook. & Arn.) Benth. & Hook. var. *mexiae* B.L. Robins., Contr. Gray Herb. II. 96:18. 1931. *Hofmeisteria urenifolia* (Hook. & Arn.) Walp. var. *mexiae* (B.L. Robins.) McVaugh, Contr. Univ. Michigan Herb. 9:402. 1972. TYPE: MEXICO. Jalisco: E of San Sebastian, 15 Feb 1927, Y. *Mezia* 16842 (HOLOTYPE: GH!; Isotype: F!).

King (1967) placed this taxon in synonymy under *Hofmeisteria standleyi* (S.F. Blake) King & H. Robins. without comment. McVaugh (1984) treated it as a variety of *H. urenifolia*, at the same time retaining *H. standleyi*. McVaugh notes that *H. mexiae* "is a distinctive plant, at once recognizable by the foliage alone, or by the dense matted pubescence of the stems...." Indeed, relatively invariant recent collections, all from the general area of the type locality, strongly suggest that the taxon is deserving of specific rank.

Hofmeisteria schaffneri (A. Gray) King & H. Robins.

The type of this taxon is from the state of San Luis Potosí, near Cd. San Luis Potosí. It was recognized by both King (1967) and McVaugh (1984), the latter noting that it occurs in mostly more interior, more montane, sites than *Hofmeisteria urenifolia* (1500-2500 m vs. 600-1200 m). King (1967) maps, but does not cite, a collection of *H. schaffneri* from the state of Guanajuato. Other than the latter, and the type itself, the species is known to me only by the sites shown in Fig. 2.

Hofmeisteria sinaloensis Gentry

This taxon is known only by two collections, both obtained from Sierra Tacnichamona, an isolated range about 1300 m high, located about 50 km SSE of Culiacán, Sinaloa (Gentry 1946). King (1967) retained the species but inexplicably mapped one of the syntypes as occurring in southernmost Sinaloa.

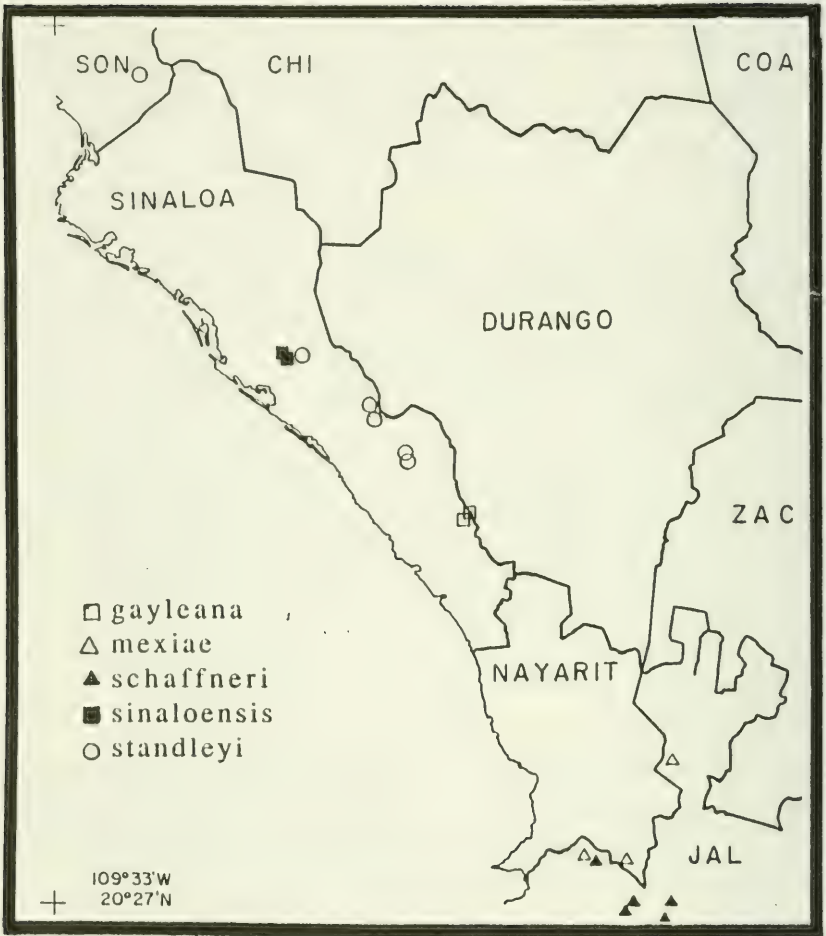


Fig. 2 Distribution of *Hofmeisteria* spp. in Sinaloa and adjacent states.

Hofmeisteria standleyi (S.F. Blake) King & H. Robins.

King (1967) recognized this species, but McVaugh (1984) placed it in synonymy under *Hofmeisteria urenifolia* without comment. I intend to recognize the species. It is known to me only by collections from southernmost Sonora along the Pacific slopes to about latitude 24° N in Sinaloa (Fig. 2). King (1967) maps two collections as occurring in southern Nayarit and closely adjacent Jalisco, but these are apparently collections of what I take to be *H. meziae*, which King treated as synonymous with *H. standleyi*.

ACKNOWLEDGMENTS

I am grateful to Guy Nesom for the Latin diagnosis and to him and Jackie Soule for reviewing the manuscript. Nancy Webber provided the illustration.

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A NEW SPECIES OF *LASIANTHAEA* (ASTERACEAE, HELIANTHEAE)
FROM SINALOA, MEXICO

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ABSTRACT

A new species, *Lasianthaea ritovegana* B. Turner, is described and illustrated. It is related to *L. rosei* of Nayarit but differs in a number of characters including scapose habit, globose tubers, less reticulately veined leaves, and having sessile heads borne upon elongate naked peduncles.

KEY WORDS: Asteraceae, *Lasianthaea*, México, Sinaloa

Routine identification of Mexican Asteraceae has revealed the following novelty.

Lasianthaea ritovegana B. Turner, *sp. nov.* Fig. 1. TYPE: MEXICO. Sinaloa: Mpio. de San Ignacio La Cebolla, ca. 40 km al N de San Ignacio, pine-oak woodland, rocky hillsides, ca. 1500 m, 20 Aug 1980, *Rito Vega A. & S. Palazuelos N. 819* (HOLOTYPE: TEX).

Lasianthaeae rosei Greenman similis sed differt habitu scaposo, foliis minus reticulatis, capitulis 3-5 sessilibus en pedunculo communi nudo 34-47 cm longo, et bracteis receptaculi apicibus anguste acutis.

Tuberous acaulescent herbs 35-50 cm high. Stems pilose below with multiseptate spreading hairs 1-2 mm long, the hairs ascending or strigose along the upper portions. Leaves 2-3 pairs at or near the base, 7-15 cm long, 3-5 cm wide; petioles 3-10 mm long, pubescent like the lower stems; blades elliptic, about equally tapering at both ends, pinnately veined, the undersurfaces sparsely pubescent with appressed hairs, these mostly along the veins, the

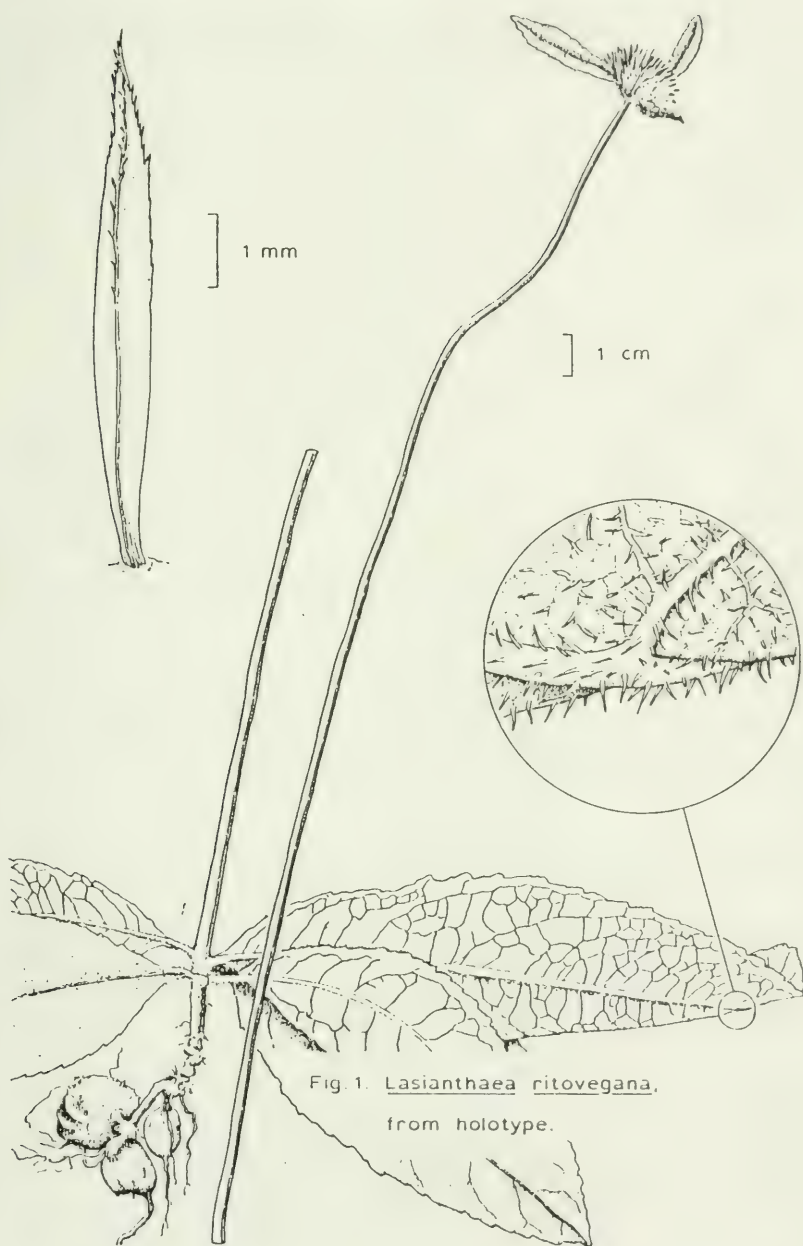


Fig. 1. *Lasianthaea ritovegana*,
from holotype.

margins irregularly serrate. Heads 3-5, sessile in leaflike bracts, the whole unit borne upon a naked peduncle 34-47 cm long. Involucres campanulate, 7-9 mm high, the bracts 3-4 seriate, subgraduate, elliptical, chartaceous, brownish with purple, ciliate apices. Receptacle convex, the pales with rigid, narrowly acute, ciliate, purple apices. Ray florets 5-8, pistillate, fertile, the ligules 3-6 mm long, ca. 3 mm wide. Disk florets ca. 20-40, the corollas ca. 6.5 mm long, purplish, glabrous except for the hispidulous lobes. Anthers purple, the appendages yellow. Achenes of ray florets (immature) 3 sided and obviously winged, the disk achenes immature.

ADDITIONAL SPECIMEN EXAMINED: MEXICO. Sinaloa: Mpio. Cosalá, el Camichín a 3 km al poniente de Guadalupe de los Reyes, tropical deciduous forest, 500-700 m, 21 Sep 1989, *Rito Vega A. 3492* (TEX).

Lasianthaea ritovegana is closely related to *L. rosei* of Nayarit. It differs from the latter in having less reticulately veined leaves which are confined to the very base of the stem, and heads borne sessile on a common peduncle 34-47 cm long. Additionally, the tubers are globose in *L. ritovegana* (vs. fusiform) and the receptacular bracts have narrowly acute apices (vs. obtuse or rounded apices).

It is a pleasure to name this attractive herb for its principal collector, Rito Vega A., Curator of Herbarium CIIDIR, Cd. Durango.

ACKNOWLEDGMENTS

I am grateful to Guy Nesom for the Latin diagnosis and to him and Carol Todzia for reviewing the paper.

A NEW SPECIES OF *COREOPSIS* (ASTERACEAE) FROM GUANAJUATO,
MEXICO

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ABSTRACT

A new species of *Coreopsis*, *C. guanajuatensis* B. Turner, is described from the state of Guanajuato, México. It belongs to the section *Pseudoagarista* of *Coreopsis* and is closely related to *C. queretarensis* B. Turner and *C. macvaughii* Crawford, but differs from both in having larger, bipinnately dissected, leaves.

KEY WORDS: Asteraceae, *Coreopsis*, México

Routine identification of unidentified Asteraceae from the University of Michigan Herbarium (MICH) has revealed the following novelty.

Coreopsis guanajuatensis B. Turner, *sp. nov.* Fig. 1. TYPE: MEXICO.

Guanajuato: "Road from Xichú to San Luis de la Paz. . . sparse oak forest in west-facing hills; 24 miles west of Xichú," 2600 m, 14 Jun 1967, *Rogers McVaugh 14814* (HOLOTYPE: MICH!).

Coreopsi queretarensi B. Turner similis sed foliis majoribus laminis bipinnatim dissectis (vs. simplicibus et tantum lobatis) differt.

Shrub or shrublets to 30 cm high. Stems densely puberulent with crisped white hairs mostly 0.5 mm long or less. Leaves opposite, once or twice dissected, puberulent throughout, mostly 2.5-5.0 cm long, 2-3 cm wide; petioles 5-15 mm long; primary leaf divisions ovate in outline, their ultimate divisions or lobes 1-6 mm long. Heads solitary on terminal peduncles 3-6 cm long. Involucres hemispheric, ca. 3 cm wide (across the extended rays), the bracts biseriate; outer bracts 8-11, oblanceolate, 4-5 mm long, white puberulent; inner bracts 8-11, free, lanceolate elliptic, 6-7 mm long, ca. 2 mm wide. Receptacle ca. 4 mm across, the pales scarious, markedly pubescent, shorter



Figure 1. *Coreopsis guanajuatensis*, holotype.

than the florets. Ray florets 8, neuter, the ligules yellow, 10-12 mm long, 2-3 mm wide. Disk florets 50-60 (estimated), the corollas yellow, 4.5-6.0 mm long, glabrous, the tubes 1.5-2.0 mm long, the lobes ca. 0.7 mm long. Anthers yellow, the appendages lanceolate, eglandular. Style branches with triangular, rather abruptly conical, appendages. Achenes (immature) ciliate along the margins with hairs 1-2 mm long, the adaxial surfaces glabrous, the abaxial surfaces pilose; pappus of two persistent, linear-lanceolate, barbellate, scales or awns 4-5 mm long.

The collection label notes the plant to be a shrub to 30 cm high and occurs "in clumps in crevices." *Coreopsis guanajuatensis* is closely related to the recently described *C. queretarensis* B. Turner (Turner 1986), sharing most of the head, floral, and achenial features of that species but differs in having much larger, once or bipinnately dissected leaves (vs. simple and merely lobate). Both species belong to the section *Pseudoagarista* of *Coreopsis* and both are related to *C. macvaughii* Crawford and *C. rudis* (Benth.) Hemsley.

ACKNOWLEDGMENTS

I am grateful to Guy Nesom for the Latin diagnosis and to him and T.P. Ramamoorthy for reviewing the manuscript.

LITERATURE CITED

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NEW SPECIES OF *PHILODENDRON* SUBGENUS *PTEROMISCHUM*
(ARACEAE) FROM MESOAMERICA AND PACIFIC SOUTH AMERICA

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ABSTRACT

Five new species in *Philodendron* subg. *Pteromischum* are described from Mesoamerica and northwestern South America. *Philodendron alliodorum* Croat & Grayum ranges from Nicaragua to Ecuador, *P. ensifolium* Croat & Grayum from Costa Rica to Pacific Colombia; *P. herbaceum* Croat & Grayum and *P. opacum* Croat & Grayum range from Costa Ricato coastal Ecuador. *Philodendron standleyi* Grayum is a strictly Mesoamerican species, distributed at midelevations from southern México to western Panamá.

KEY WORDS: Araceae, *Philodendron*, *Pteromischum*, México, Guatemala, Honduras, Nicaragua, Costa Rica, Panamá, Colombia, Ecuador

During the course of my ongoing revision of *Philodendron* subg. *Pteromischum* (Araceae), a number of undescribed taxa have come to light. The following five novelties are described at the present time in order to make the names available for several impending floristic treatments. Only fertile specimens are cited. More detailed accounts and specimen citations, as well as illustrations, will be provided in the revision.

Philodendron alliodorum Croat & Grayum, *sp. nov.* TYPE: COSTA RICA. San José: western part of Montañas Jamaica, ca. 3 km NE of Bijagual de Turrubares, Carara reserve, 9° 45.5' N, 84° 33' W, 500-600 m, 7 Aug. 1985, *M.H. Grayum, R. Warner, J.C. French, & P. Sleeper* 5857 (HOLOTYPE: MO-3446392!; Isotypes: BM,CR,NY,US).

Plantae fruticosae scandentes usque ad minimum 10 m altae; petioli 5.6-13.6 cm longi vagina involuta marginibus scariosis fragilibusque; laminae anguste vel late ellipticae aut lanceolatae vel

oblanceolatae 13.4-32.2 cm longae ca. 2.0-3.5 plo longiores quam breviores valde inaequilaterales nervis lateralibus utroque latere 10-14 in sicco brunneolis vel rubellis; fructus maturi noctu alliodori.

Shrubby, much branched, rigidly clambering plants, ascending to at least 10 m on tree trunks, the fertile branches divergent. *Internodes* drying stramineous to midbrown, the epidermis slightly to moderately brittle and flaky; nodal roots absent, except on juvenile shoots. *Petiole* 5.6-13.6 cm long, the sheath involute with the edges brownish, dry and cracking, the unsheathed portion obsolete or to 0.3(-0.5) cm long. *Lamina* in life thinly coriaceous to subcoriaceous, semiglossy to glossy both sides, narrowly to broadly elliptical to lanceolate or oblanceolate, markedly inequilateral, gradually to abruptly acuminate apically, narrowly to broadly cuneate or (more rarely) truncate to rounded basally, 13.4-32.2 cm long, 3.2-14.0 cm wide; primary lateral veins 10-14 per side. *Bracteoles* absent. Inflorescences solitary, very rarely paired; peduncle subterete, with pale, short lineations, (0.6-)1.1-3.5 cm long (to at least 4.4 cm in fruit); *spathe* at anthesis externally green and often whitish lineolate below, paler (greenish white to cream) distally, often with pale whitish spots, internally uniformly whitish, 6.8-15.0 cm long, 1.4-3.6(-4.1) cm wide. *Spadix* 5.9-12.3 cm long, the fertile male portion cream colored, 0.6-1.2 cm wide; sterile male zone 0.7-1.2 cm long; female portion of spadix 1.1-4.3 cm long (to at least 8.3 cm in fruit), 0.50-1.25 cm wide (to at least 2.1 cm in fruit), pale green or yellowish; fertile male flowers 0.8-1.7 mm long, 0.6-2.0 mm wide, irregularly polygonal; sterile male flowers 1.2-2.3 mm long, 0.7-1.7 mm wide, cuboidal to claviform; female flowers 1.3-2.1 mm long, 0.5-0.9 mm wide, the stylar canals 4-5. Ripe fruits very pale yellowish orange (ochroleucous), emitting a pronounced garlicky odor at night. *Seeds* straight to somewhat (or occasionally strongly) curved, twisted or spindled, finely striate with the striae cancellate, (0.7-)0.9-1.0 mm long, ca. 0.2 mm wide.

PARATYPES: NICARAGUA. Río San Juan: Moreno 26101 (MO). Zelaya: Stevens 8848 (MO).

COSTA RICA. Alajuela: Croat 46970 (MO). Heredia: Burger & Stolze 5892 (CR,F); Folsom 9883 (MO); Grayum 2303 (MO), 2842 (MO), 3059 (DUKE), 8594 (MO), 8659 (CR), 9447 (CR,MO); Grayum & Chavarria 8287 (MO); Jacobs 2322 (DUKE), 2533 (DUKE), 2702 (DUKE,MO,NY), 2773 (DUKE); Jacobs & Ford 2809 (DUKE); Jacobs & Smith 2464 (DUKE,MO); Kress 84-1625 (SEL); Proctor 32113 (IJ,LL,MO); Stevens 13315A (MO); Wilbur 37153 (DUKE), 37603 (DUKE). Limón: Gómez et al. 20555 (MO); Grayum 9797 (CR,MO). Puntarenas: Burger & Liesner 7227 (F,PMA); Burger & Mata U. 4805 (F); Burger & Stolze 5427 (CR,F,US); Croat & Grayum 59720 (CR,MO); Grayum et al. 4084 (CR,MO), 7565 (CR,MO); Knapp 2183 (MO); Liesner 1861 (MO). San José: I. Chacón 346 (MO).

PANAMA. Bocas del Toro: McPherson 12564 (MO); Thompson 4931

(CM). Darién: *Croat* 38004 (MO), 68868A (MO); *Duke* 5168 (MO); *Gentry et al.* 28544 (MO); *Hammel et al.* 16185 (MO), 16190 (MO); *McPherson* 7079 (MO), 11555 (MO), 12237 (MO), 15008 (MO); *Sullivan* 692 (MO). Panamá: *Hamilton & Stockwell* 1047 (MO); *Hammel* 7334 (MO); *Knapp et al.* 4745 (MO); *Thompson* 4626 (CM,MO), 4787 (CM); *Tyson & Nee* 7345 (MO).

COLOMBIA. Antioquia: *Brand* 1039 (MO); *Rentería* 3766 (MO). Chocó: *E. Forero et al.* 4123 (COL,MO), 4231 (COL,MO). Valle: *Croat* 61363 (MO).

ECUADOR. Carchi: *Madison & Besse* 7029 (QCA,US); *Ollgaard et al.* 57267 (AAU). Cotopaxi: *Sparre* 17116 (S), 17328 (S). Esmeraldas: *Barfod et al.* 48246 (AAU); *Madison et al.* 5201 (SEL). Guayas: *Camp E-3848* (NY); *Lehmann* 6458 (K). Los Ríos: *Dodson* 6652 (F,MO,QCA,SEL); *Gentry et al.* 54761 (MO); *Madison* 3839 (SEL). Pichincha: *Hammel & Trainer* 15838 (MO); *Madison* 3813 ['Los Ríos'] (SEL); *Sparre* 14058 (S).

Philodendron alliodorum is distinguished by its high climbing habit, relatively short, fully sheathed petioles, involute petiole sheath with the margins brittle and scarious, and comparatively narrow (2.0-3.5 times longer than wide), markedly inequilateral leaf blades with 10-14 primary lateral veins per side. This is a species more easily recognized on herbarium sheets than in life, as the leaf blades generally dry with a distinctive brownish or reddish cast.

Philodendron alliodorum is common in primary forest from northeastern Nicaragua to Guayas Province, Ecuador, at elevations of 0-800(-1000) m. It is ecologically versatile, occurring in Tropical Wet, Premontane Wet, and Premontane Rain Forest and extending more sparingly into Tropical and Premontane Moist Forest. Although flowering collections have been made in every month of the year except September, over 75% are from March-July.

The specific epithet of *Philodendron alliodorum* derives from the pronounced garlicky odor emitted by the ripe fruits.

Philodendron ensifolium Croat & Grayum, *sp. nov.* TYPE: COSTA RICA. Limón: Cordillera de Talamanca, ridge separating Río Madre de Dios from Quebrada Cañabral and slope leading down to former, 10° 02' N, 83° 26' W, 440-460 m, 2 Sep. 1988, *M. Grayum, G. Herrera, & R. Robles* 8697 (HOLOTYPE: CR!; Isotypes: F,K,MO).

Plantae epiphyticae caulibus adpressis in sicco viridibus; petioli (12.8-)13.1-29.9 cm longi vagina plerumque erecta parte non vaginata 0-0.1(-0.8) cm longa; laminae tenuiter coriaceae vel subcoriaceae supra nitidae vel seminitidae infra similes (26.7-)34.1-54.4 cm longae (2.0-)4.5-10.9 cm latae nervis lateralibus utroque latere 3-6+; inflorescentiae 1-2(-3) pedunculo (0.8-)1.7-4.2(-8.5) cm longo; spathe fructifera aurantiaca; spadix 8.2-11.9 cm longa parte feminea 0.9-1.7 cm lata; semina cochleata.

Appressed climbing understory vine on trunks, fertile at ca. 2-7 m above the ground. *Internodes* drying green and finely striate stems with roots at most distal nodes. *Petiole* (12.8-)13.1-29.9 cm long, the sheath erect (usually) to spreading, the unsheathed portion 0-0.1(-0.8) cm long. *Lamina* in life thinly coriaceous to subcoriaceous, semiglossy to glossy above, matte (rarely) to semiglossy or glossy below, linear-lanceolate to narrowly lanceolate or oblanceolate, gradually long acuminate apically, broadly cuneate or subtruncate basally, (26.7-)34.1-54.4 cm long, (2.0-)4.5-10.9 cm wide; primary lateral veins obscure or occasional, usually ca. 3-6 pairs countable. *Bracteoles* of regular occurrence, 6.0-12.3 cm long, 0.4-1.9 cm wide. Inflorescences solitary, paired or occasionally 3; peduncle densely green lineate, (0.8-)1.7-4.2(-8.5) cm long; *spathe* at anthesis externally weakly glossy to semiglossy, green below, yellow-green and densely pale short lineate distally, becoming uniformly orange in fruit, internally greenish white, 11.6-17.5(-19.1) cm long. *Spadix* 8.2-11.9 cm long, the fertile male portion chalk white, 0.5-1.2 cm wide; sterile male zone 0.6-1.5 cm long; female portion of spadix 2.3-3.4(-4.0) cm long, 0.9-1.7 cm wide, pale greenish; fertile *male flowers* polygonal, somewhat laterally compressed, 1.8-2.3 mm long, 0.9-2.1 mm wide; sterile male flowers obconic, often laterally compressed, 1.8-3.5 mm long, 1.1-2.6 mm wide; *female flowers* 2.0-3.3 mm long, 1.0-1.3 mm wide, the styler canals 3-4. Color of ripe fruits unknown. *Seeds* in life red, cochleate, finely striate with the striae minutely cancellate, 0.4-0.5 mm diam.

PARATYPES: COSTA RICA. Alajuela: Croat 36367(MO), 36434(F,MO); Hammel et al. 9592['Guanacaste'] (DUKE,MO), 14042(MO). Heredia: Grayum 2834(F,MO); Lent 2129(F).

PANAMA. Coclé: Croat 67523(MO); Hammel 2570(MO); Miller et al. 794(MO); Thompson 4751(CM). Panamá: Croat 34783(MO), 67348(MO); Kennedy & Dressler 3343(US). San Blas: de Nevers et al. 6146(MO); Hamilton & Stockwell 1078(MO); McPherson 11032(MO). Veraguas: Croat 25949(MO); Mori & Kallunki 3187(MO).

COLOMBIA. Chocó: Duke 11483(NY). Valle: Gentry et al. 47911(MO).

Philodendron ensifolium is usually immediately distinguished from all other *Pteromischum* species in the region by its green stems, fully sheathed petioles and very narrow (usually more than 4.5 times longer than wide), highly glossy leaf blades with the primary lateral veins adaxially obscure. It is similar to the closely related *Philodendron senatocarpum* Madison (1977) of Ecuador in possessing orange fruiting spathes and cochleate seeds, but differs in its persistently green stems, smaller and proportionately narrower leaf blades, and typically paired (rather than solitary) inflorescences smaller in all their dimensions.

Philodendron ensifolium ranges from extreme northeastern Costa Rica (and probably southeastern Nicaragua) to Valle Department, Colombia, at elevations of 0-950(-1100) m. It occurs exclusively in Tropical and Premontane

Wet Forest in Panamá and Costa Rica, but primarily in Tropical and Premon-tane Rain Forest in Colombia. Flowering appears to be concentrated from June-August.

The specific epithet refers to the narrow, swordlike leaves of this species.

Philodendron herbaceum Croat & Grayum, *sp. nov.* TYPE: COSTA RICA. Heredia: Finca La Selva, at confluence of Río Sarapiquí and Río Puerto Viejo, Atlantic slope, 10° 26' N, 84° 01' W, 50-80 m, 22 Sep. 1986, M.H. Grayum 7672 (HOLOTYPE: MO-3491551!; Isotypes: CR,K).

Plantae graciles scandentes usque ad 3 m altae caulibus in sicco viridibus subtiliter striatisque nodis radicantibus; petioli (5.4-)7.4-10.5(-11.3) cm longi vagina involuta; laminae membranaceae vel tenuiter coriaceae lanceolatae aut anguste vel late ovatae, oblanceolatae vel ellipticae (7.9-)12.0-19.9(-23.8+) cm longae (3.5-)4.0-8.8 (-9.0) cm latae; inflorescentiae plerumque solitariae; pagina interior spathae striis secretoriis carentibus; spadix (7.30-)8.40-12.15 (-15.00) cm longa zona distali sterili; pars feminea spadicis (0.45-) 0.60-0.85(-1.55) cm lata.

Slender stemmed vine clambering among understory shrubs and treelets or climbing (often twining) on small trunks to no more than ca. 3 m above ground, the fertile branches divergent with the inflorescences held erect. *Internodes* drying green, finely striate, the epidermis typically tessellate; roots present but few at distal nodes. *Petiole* (5.4-)7.4-10.5(-11.3) cm long, the sheath involute, the margins scarious and brittle, the unsheathed portion obsolete or to 0.3 cm long. *Lamina* in life membranous or thinly coriaceous, subchartaceous, semiglossy to glossy above, matte or weakly glossy to glossy below, lanceolate to narrowly or broadly ovate, oblanceolate or elliptical, somewhat abruptly to gradually acuminate apically, cuneate to rounded, subtruncate or subcordate basally, (7.9-)12.0-19.9(-23.8+) cm long, (3.5-)4.0-8.8(-9.0) cm wide; primary lateral veins (7-)11-12(-14) per side. *Bracteoles* occasional, 3.9-5.3 cm long, 0.35-0.55 cm wide. Inflorescences solitary or (less commonly) paired; peduncle subterete, with raised whitish striations, 1.65-4.00(-4.50) cm long; *spathe* at anthesis externally semiglossy, pale yellow green to green below, yellowish green to greenish white or white distally, internally rather uniformly light green to white, without secretory striations, 7.9-14.2(-16.0) cm long, 1.40-2.45 cm wide. *Spadix* (7.30-)8.40-12.15(-15.00) cm long, with apical sterile male zone 1.8-4.2 cm long; fertile male portion of spadix white, (0.30-)0.45-0.55 (1.70) cm wide; intermediate sterile male zone 0.25-0.80 cm long; female portion of spadix 2.05-3.90(-4.10) cm long, (0.45-)0.60-0.85(-1.55) wide, pale green or yellow green; apical sterile male flowers more or less mushroom shaped, 0.95-1.25 mm long, 0.6-2.7 mm wide; fertile male flowers irregularly polygonal, columnar, 0.8-1.3 mm long, 0.6-1.3 mm wide; intermediate sterile male flowers

anvil or goblet shaped, with oily appearance, 1.2-1.7 mm long, 1.1-1.8 mm wide; female flowers 1.3-1.9 mm long, 0.8-1.3 mm wide, the stylar canals probably mostly 4. Ripe fruits very pale ochroleucous (essentially white). Seeds in life white, curved 6- or C-wise or (rarely) nearly in a circle, finely striate with the striae vaguely cancellate (0.50-)0.65-0.75(-0.80) mm long, 0.2-0.3 mm wide,

PARATYPES: COSTA RICA. Heredia: *Grayum* 1840 (DUKE), 2026 (DUKE), 2276 (DUKE), 2282 (DUKE), 2297 (DUKE), 2924 (DUKE), 2932 (DUKE), 2933 (DUKE), 2981 (MO), 9988 (CR,MO); *Grayum* & Greig 8301 (MO); *Grayum* & Hammel 5569 (CR,MO); *Grayum* & Jacobs 5335 (MO); *Grayum* et al. 5552 (CR,MO); *Jacobs* et al. 2515 (DUKE); *Kress* 84-1631 (SEL); *MacDougal* 1001 (DUKE); *McDowell* 198 (DUKE,MO); *Wilbur* 37858 (DUKE), 39243 (DUKE). Limón: *Grayum* 9836 (CR,MO); *Hammel* et al. 17529 (CR,MO). San José: *Gómez* et al. 22907 (CR,MO).

PANAMA. Bocas del Toro: *McPherson* 12562 (MO); *von Wedel* 1946 (F,GH,MO). Coclé: *Grayum* & Evans 9888 (MO); *Thompson* 4728 (CM,MO), 4753 (CM,MO,SEL). Panamá: *Nee* & *Warmbrodt* 10340 (MO).

COLOMBIA. Valle: *Maas* & *Plowman* 1972 (GH,U).

ECUADOR. Pichincha: *Dodson* 11596 (MO,SEL).

Philodendron herbaceum is recognized by its small size, appressed climbing or twining habit with adventitious roots at most nodes, persistently green stems, relatively short, fully sheathed petioles with the sheath involute, absence of secretory striations on the inner spathe surface and relatively long, slender spadices with a conspicuous apical sterile zone.

Philodendron herbaceum is distributed from extreme northeastern Costa Rica (and probably southeastern Nicaragua) to Pichincha Province, Ecuador, at elevations of 0-700(-850) m. It is characteristically a species of Tropical Wet and Premontane Wet (warm transition) Forest. *Philodendron herbaceum* has been collected in flowering condition during every month from February through October, with a peak from June to August.

The specific epithet refers to the growth habit of these plants as well as the uniformly bright green coloration of most organs.

***Philodendron opacum* Croat & Grayum, sp. nov.** TYPE: PANAMA.

Darién: Parque Nacional Darién, trocha limítrofe al NO en la vecindad de la Estación Pirre, 08° 00' N, 77° 45' W, 150 m, 7 Oct. 1990, H. Herrera 692 (HOLOTYPE: PMA!; Isotypes: CR,MO,K).

Plantae epiphyticae caulibus adpressis in sicco stramineis grosse sulcatisque; petioli 16.6-29.5(-35.2) cm longi vagina pro parte maxima erecta parte non vaginata 3.5-10.7 cm longa; laminae tenuiter coriaceae vel subcoriaceae supra impolitae vel seminitidae infra similes 17.7-43.4 cm longae 7.8-18.8 cm latae nervis lateralibus

utroque latere 5-9; inflorescentiae 1-2 pedunculo 3.7-5.8(-7.7) cm longo; spadix (5.2-)9.0-12.8(-14.8) cm longa parte feminea 0.9-1.6 cm lata.

Appressed climbing vines in understory, generally fertile 2-5 m above ground. *Internodes* drying tan or yellowish brown, coarsely sulcate; stems with nodal roots. *Petiole* 16.6-29.5(-35.2) cm long, the sheath erect or involute toward apex, the unsheathed portion 3.5-10.7 cm long. *Lamina* in life thinly coriaceous to subcoriaceous, matte or velvety to semiglossy above, matte to semiglossy below, narrowly to broadly ovate to broadly or more or less narrowly lanceolate, elliptic, oblong or broadly oblanceolate, abruptly to gradually acuminate apically, cuneate, truncate, or rounded basally, 17.7-43.4 cm long, 7.8-18.8 cm wide; primary lateral veins 5-9 per side. *Bracteoles* commonly present, 6.0-10.0 cm long, 0.4-1.8 cm wide. Inflorescences usually solitary, occasionally paired; peduncle flattened on one side with the margins rounded, weakly striate distally, 3.7-5.8(-7.7) cm long (to at least 9.0 cm post anthesis); *spathe* at anthesis externally matte, medium green, becoming paler distally, internally pale green, 12.6-17.7 cm long (to at least 21.6 cm post anthesis), 1.8-3.9 cm wide. *Spadix* (5.2-)9.0-12.8(-14.8) cm long, the fertile male portion cream-white, 0.80-1.45 cm wide; sterile male zone 0.6-1.6 cm long; female portion of spadix 2.3-5.7 cm long (to at least 6.1 cm toward fruit), 0.9-1.6 cm wide (to at least 3.0 cm toward fruit), pale green; fertile *male flowers* irregularly polygonal, 1.0-1.8 mm long, 0.6-1.9 mm wide; sterile male flowers incudiform and more or less laterally compressed, with texture of beeswax, 1.4-3.1 mm long, 1.0-2.6 mm wide; *female flowers* 2.2-2.8 mm long, 0.6-1.0 mm wide, the stylar canals (4-)5(-6). Ripe fruits translucent-whitish. *Seeds* in life purple, purplish violet or lavender, straight to somewhat spindled or slightly curved, finely striate with the striae minutely and obscurely cancellate, 0.6-0.8(-1.0) mm long, 0.15-0.25(-0.30) mm wide.

PARATYPES: COSTA RICA. Alajuela: *Burger & Baker 9979* (CHAPA, CR,F). Heredia: *Grayum 2731* (DUKE), *2756* (DUKE,F,MO), *8656* (CR), *10222* (CR); *MacDougal 1094* (DUKE). Puntarenas: *Croat 67631* (MO); *Gómez 22930* (MO); *Grayum 4116* (CR,MO); *Grayum & Fleming 8120* (CR, MO).

PANAMA. Canal Zone: *Croat 4647* (MO), *6500* (F,MO), *6793* (MO), *12464* (MO), *12604* (MO); *Gentry & Nee 8645* (MO); *Kennedy 1850* (MO,US); *Nee & Gentry 8661* (MO); *Pittier 2262* (US); *Standley 40889* (US). Coclé: *Croat 67476* (MO). Colón: *Croat 36979* (MO); *Mori & Crosby 6421* (MO). Darién: *Hammel et al. 16157* (MO), *16189* (MO), *16425* (MO); *H. Herrera et al. 951* (MO); *McPherson 11547* (MO,PMA).

COLOMBIA. Cauca: *Collenette 568* (K). Chocó: *von Sneider A227* (S).

ECUADOR. Esmeraldas: *Asplund 16515* (S). Los Ríos: *Dodson 5699* (SEL); *Grayum & Zamora 9378* (MO).

Philodendron opacum is easily distinguished by its appressed climbing habit, stem epidermis drying yellowish brown and coarsely sulcate, erect, proportionately short petiolar sheaths (with the unsheathed portion of the petiole more than 3.5 cm long), subcoriaceous, matte leaf blades (the surface drying densely alveolate) with only 5-9 primary lateral veins and relatively stout spadices, sometimes paired, on peduncles more than 3.5 cm long.

Philodendron opacum is rather spottily distributed from northern Costa Rica (and ostensibly southeastern Nicaragua) to Los Rios Province, Ecuador, at elevations of 0-850(-1000) m, with an outlying population on the eastern slope of the Colombian Cordillera Central in Antioquia Department. In Costa Rica and Panamá, *P. opacum* appears largely restricted to Tropical Wet and Premontane Wet (warm transition) Forest, however in Colombia it extends into Premontane Rain Forest (warm transition). It has been collected in fertile condition in every month of the year, but shows a pronounced peak from September through November, with a secondary peak in March and April.

The specific epithet is in reference to the dull or matte leaf blades of this species.

***Philodendron standleyi* Grayum, *sp. nov.* TYPE: COSTA RICA. Puntarenas: Monte Verde Reserve, Cordillera de Tilarán 10° 18' N, 84° 47' W, 1500-1600 m, 5 Jun. 1986, *M.H. Grayum, P. Sleeper, & R. Sleeper 7581* (HOLOTYPE: MO-3486472!; Isotypes: CR, HMN, K, MEXU, PMA, TEFH, US, USCG).**

Plantae epiphyticae caulibus adpressis in sicco stramineis grosse sulcatisque; petioli (13.6-)18.9-37.8(-42.0) cm longi vagina saltem parte proximali erecta parte non vaginata (0.9-)2.0-4.6(-7.1) cm longa; laminae ovatae aut late lanceolatae vel ellipticae (17.6-)22.1-40.3(-54.8) cm longae (7.3-)10.3-21.5(-27.2) cm latae nervis lateralibus utroque latere (5-)8-15(-21); inflorescentiae 1-2 pedunculo (2.3-)3.4-7.1(-8.6) cm longo; spadix 9.0-15.3(-16.9) cm longa parte feminea 0.7-1.0 cm lata.

Typically appressed climbing epiphyte on trunks of trees, climbing to at least 10 m, usually fertile at least 2.5 m above ground, the fertile branches sometimes swooping divergent. *Internodes* drying yellowish brown to mid-brown, coarsely sulcate, the epidermis brittle; roots abundant at distal nodes. *Petiolo* (13.6-)18.9-37.8(-42.0) cm long, the sheath involute to erect proximally, erect to horizontally splayed distally, the unsheathed portion (0.9-)2.0-4.6(-7.1) cm long. *Lamina* in life thinly coriaceous to subcoriaceous, matte to glossy on both sides, ovate to broadly or narrowly lanceolate or elliptical, abruptly to gradually acuminate apically, subauriculate or subcordate to (most usually) rounded, truncate or broadly cuneate basally, (17.6-)22.1-40.3(-54.8) cm long, (7.3-)10.3-21.5(-27.2) cm wide; primary lateral veins (5-)8-15(-21) per

side. *Bracteoles* frequently present, (4.9-)6.9-11.6(-17.4) cm long, 0.5-1.5 cm wide. Inflorescences solitary or paired; peduncle subterete, finely to coarsely greenish striate, (2.3-)3.4-7.1(-8.6) cm long; *spathe* at anthesis externally light green to cream yellow or cream proximally and becoming coarsely dark green striate, cream colored distally, internally greenish white and sometimes reddish flecked proximally, cream colored distally, (10.2-)15.0-18.3(-22.1) cm long, 1.3-2.9(-3.4) cm wide. *Spadix* 9.0-15.3(-16.9) cm long, the fertile male portion cream colored or white, (0.55-)0.80-1.00(-1.15) cm wide; sterile male zone 0.70-1.25 cm long; fertile female portion of spadix 2.4-5.1(-5.9) cm long (to at least 7.7 cm in fruit), 0.7-1.0 cm wide (to at least 2.5 cm in fruit), pale yellowish to yellowish green; fertile *male flowers* irregularly polygonal, columnar or slightly anvil shaped, 0.9-1.7 mm long, 0.7-1.8(-2.4) mm wide; sterile male flowers anvil shaped or more or less mushroom shaped, 1.25-1.80 mm long, 0.9-2.4 mm wide; *female flowers* 1.5-2.1(-2.9) mm long, 0.6-1.1(-1.4) mm wide, the stylar canals 4-6. Color of ripe fruits unknown. *Seeds* in life dark purple, straight to slightly curved or bent, finely striate with the striae minutely cancellate, 0.9-1.1 mm long, 0.25-0.30 mm wide.

PARATYPES: MEXICO. Chiapas: *Breedlove* 35169 (DS); *Breedlove & Bourell* 67984 (CAS); *Matuda* 18651A (MEXU,NY).

GUATEMALA. Baja Verapaz: *Croat* 41358 (MO,SEL). Quezaltenango: *Castillo M. & Hodel* 1062 (MO).

HONDURAS. La Paz: *Molina R. & Molina* 14043 (EAP,F). Santa Bárbara: *Clewell & Hazlett* 3883 (EAP,MO).

COSTA RICA. Alajuela: *Barringer et al.* 2445 (F); *Burger [et al.]* 11913 (F,MO); *Grayum & Hammel* 5518 (MO); *Grayum et al.* 8110 (MO), 10195 (CR); *Haber & Bello* 7905 (CR,MO); *Stevens* 13560 (MO). Cartago: *Liesner & Judzewicz* 14484 (MO). Heredia: *Grayum & Jermy* 6788 (MO); *Grayum et al.* 7004 (MO). Puntarenas: *Dryer* 1414 (CR,F); *Hammel & Trainer* 13780 (MO); *Hammel et al.* 15088 (MO). San José: *Davidse et al.* 23193 (MO).

PANAMA. Chiriquí: *Croat* 66374 (MO), 66567 (MO); *Knapp* 1553 (MO); *Thompson* 5001 (CM,MO). Veraguas: *Croat & Folsom* 34194 (MO).

Philodendron standleyi is best characterized by its cloud forest habitat, appressed climbing habit, stem epidermis drying yellowish and sulcate, petioles of at least some larger leaves with the unsheathed portion 2 cm or more long, relatively large, generally semiglossy to glossy leaves with 8 or more primary lateral veins per side, and relatively long and slender, sometimes paired inflorescences on peduncles usually greater than 3 cm long.

Philodendron standleyi ranges from central Veracruz to Veraguas Province, Panamá, at elevations of (400-)600-1800(-2100) m. In southern Central America it is restricted to Premontane and Lower Montane Rain Forest, and collections from the northern part of the range indicate a similar habitat. Flowering is concentrated from April to June throughout its range, although fertile specimens have been collected during every month of the year except September

and November.

This new species is dedicated to the eminent North American botanist Paul Carpenter Standley (1884-1963), who collected it in Guatemala on at least 13 occasions despite never encountering it in fertile condition.

ACKNOWLEDGMENTS

Field work and herbarium studies relevant to the present publication were funded largely by NSF Grant BSR-8607307, and partly by NSF Grants BSR-8700068. and BSR-9004449 and National Geographic Society Grant 3317-86. I am grateful to George E. Schatz and Henk van der Werff for reviewing the manuscript.

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TWO NEW SPECIES OF *PSACALIUM* (ASTERACEAE, SENECEONEAE) FROM MEXICO

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ABSTRACT

Two new Mexican species of *Psacalium* are described: ***P. cronquistiorum*** B. Turner from southern Durango, and ***P. pentaflorum*** B. Turner from Jalisco. The former is closely related to *P. pachyphyllum*, and has been confused with that species by previous authors; the latter is related to *P. eriocarpum* and has been included in that taxon by most workers. Maps showing the distribution of the compared species, *P. pachyphyllum*-*P. cronquistiorum* and *P. eriocarpum*-*P. pentaflorum* are presented.

KEY WORDS: Asteraceae, Senecioneae, *Psacalium*, *Odontotrichum*

Preparation of a taxonomic treatment of the genus *Psacalium* for México has prompted the present paper.

Psacalium cronquistiorum B. Turner, *sp. nov.* TYPE: MEXICO. Durango: ca. 30 mi W of Cd. Durango, "rocky, rhyolitic soil in open oak-pine woodland," 8500 ft, 28 Sep 1963, A. Cronquist 9542 (HOLOTYPE: TEX!; Isotype: NY).

Psacalio pachyphylo (Sch.-Bip.) H. Robins. & Brett. similis sed differt foliis reniformibus vel cordati-reniformibus integris vel tantum crenulatis (vs. lobatis), capitulescentia ebracteata ramis pubescentibus, et pedunculis ultimis plerumque 0.5-2.5 cm longis (vs. 3-6 cm).

Perennial herb 40-60 cm high. Stems reddish, pubescent with loose reddish brown hairs, glabrate with age. Basal leaves 15-30 cm long, 12-20 cm wide; petioles 8-20 cm long; blades thick, coarsely reticulate, mostly reniform or broadly deltoid to subcordate in outline, the margins nearly entire

to merely undulate. Stem leaves 0-3, much reduced, extending to the base of the capitulescence and often into it as prominent broad bracts. Heads 5-11, arranged in rather congested stiff cymes, the ultimate peduncles 0.5-2.5 cm long, pubescent with purplish loose hairs. Involucres turbocampanulate, the bracts ca. 13, mostly 8-10 mm long, the apices acute. Florets 30-50 per head; corollas white, glabrous, ca. 9 mm long, the tubes 5.5-6.5 mm long, the lobes ca. 3 mm long. Achenes 3-4 mm long, cylindric, glabrous, striate, the pappus of numerous tawny barbellate bristles 7-9 mm long, these arranged in 2 series.

ADDITIONAL SPECIMENS EXAMINED: MEXICO. Durango: 11 km SW of La Ciudad, 2900 m, 13 Aug 1974, *Breedlove 36469* (MICH); 40 mi W of Durango, 8000 ft, 1 Nov 1943, *Gentry 6969* (MICH); 54.2 km WSW of Durango, 2725 m, 16 Sep 1978, *Illis 197* (MICH); ca. 60 mi SW of Durango, ca. 2600 m, 26-29 Aug 1952, *Maysilles 7784* (MICH); Parque El Tecuán, 58 km ESE of Durango, 4 Sep 1984 (TEX); 15 km NE of Charcas, 2600 m, 21 Sep 1982, *Fernández 1169* (TEX); 50 km W of Durango, 2550 m, 27 Sep 1962, *McVaugh 21659* (MICH, TEX); ca. 10 mi W of El Salto, 2650 m, 2 Oct 1962, *McVaugh 21729, 21731* (MICH); 17 mi SW of El Salto, 22 Sep 1953, *Ownbey 1874* (MICH); 41 mi WSW of Durango, 27 Sep 1984, *Sundberg 2889* (TEX); 23 mi NE of Durango-Sinaloa border, 9000 ft, 8 Sep 1965, *Torres 1777* (MICH); 3 mi W of El Salto, 11 Aug 1956, *Waterfall 12668* (MICH); 75 km S of Durango along highway to Le Flor, 8500-9000 m, 18 Aug 1982, *Worthington 8842* (TEX).

This taxon has previously resided under the fabric of *Psacalium pachyphyllum* (discussed below). *Psacalium cronquistorum* is distinguished from *P. pachyphyllum* by a number of characters, as shown in Table 1. McVaugh (1984) called attention to the plants here described as *P. cronquistorum* in noting, "The common plant that has been here called *Odontotrichum pachyphyllum* in western Durango differs consistently [from typical *pachyphyllum*] in having nearly entire and cordate-reniform leaves, densely pubescent inflorescences, and larger calyculate bracts." Indeed, all of the specimens cited above are cleanly and consistently distinct from *P. pachyphyllum* and occur in more inland (Fig. 1), somewhat higher, drier, habitats. *Psacalium cronquistorum* does not appear to intergrade with *P. pachyphyllum*. Indeed, it seems about equally close to *P. amplum* (Rydb.) H. Robins. & Brett, standing somewhat between the latter and *P. pachyphyllum*.

It is a pleasure to name this taxon for the late Dr. "Art" Cronquist and his wife Mabel, a wonderfully wed couple, both long time friends of mine. It is my hope that the appellation provided will be a reminder to future workers that Art was not alone in his botanical endeavours: Mabel was as essential to his success as the talent that drove him.

The following couplets will distinguish this closely related triad:

1. Leaves with 8-13 well defined shallow lobes; bracts of the capitulescence

Table 1. Comparison of species of the *Psacaliu* *pachyphyllum* complex.

	<i>P. pachyphyllum</i>	<i>P. cronquistiorum</i>	<i>P. amplum</i>
HABIT	40-80 cm high	40-80 cm	100-150 cm
LEAVES	8-13 shallow lobes rounded cordate (in outline)	entire to crenate reniform to reniform-cordate	serrate reniform cordate to reniform hastate
	relatively thin finely reticulate	thick coarsely reticulate	thick coarsely reticulate
CAPITULES- CENCE	bracts at base of branches, minute, scalelike or linear lanceolate	broad and leafy	very broad and leafy
ULTIMATE PEDUNCLES	3-6 cm long glabrous	0.5-2.5 cm pubescent	3-8 cm ± glabrous
INVOLUCRES	turbocampanulate bracts 6-8 mm long glabrous	campanulo- turbinate 8-10 mm pubescent below	campanulate 12-15 mm glabrous
CALYCVLVS	reduced linear lanceolate stiffly erect, much shorter than involucral bracts	linear to linear oblanceolate, ca. as long as bracts	well developed, oblanceolate, often longer than bracts
PAPPVS	white	tawny	white

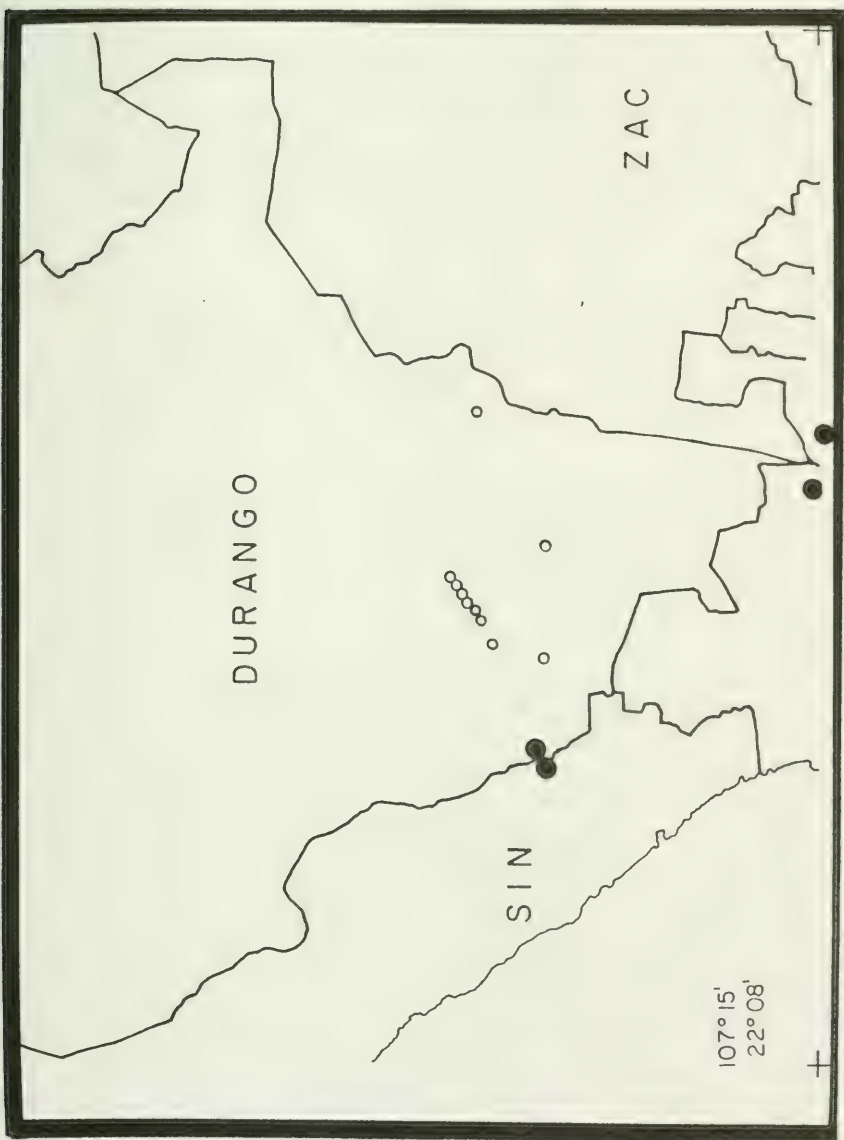


Fig. 1. Distribution of *Psacalum cronquistorum* (open circles) and *P. pachyphyllum* (solid circles).

- minute, scalelike or linear-lanceolate. *P. pachyphyllum*
1. Leaves without lobes; bracts of the capitulescence broad and leaflike. (2)
2. Plants 40-80 cm high; ultimate peduncles 0.5-2.5 cm long.
 *P. cronquistiorum*
2. Plants 100-150 cm high; ultimate peduncles 3-8 cm long.
 *P. amplum*

Psacalum pachyphyllum (Sch.-Bip.) Rydb., Bull. Torrey Bot. Club 51:417.
 1924. BASIONYM: *Caraha pachyphylla* Sch.-Bip. in Seem., Bot. Voy.
Herald 310. 1856. TYPE: MEXICO. Sinaloa (?): Sierra Madre Occi-
 dental, Dec 1849, Seemann (HOLOTYPE: BM!; Isotype: K!).

Since all subsequent collections of this taxon in Sinaloa have been from the vicinity of El Palmito, and because Seemann passed through this village on his way to Cd. Durango, I believe the type must have been obtained near El Palmito, Sinaloa (cf. discussion below).

ADDITIONAL SPECIMENS EXAMINED: MEXICO. Jalisco: 3.6 km N of San Andrés Cohamiata, and 2.1 km S of Cerro La Monja, ca. 6450 ft, 16 Oct 1852, *Bauml 1210* (MICH). Nayarit: Sierra de los Huicholes, 5-10 km by road SW of Zacatecas-Nayarit boundary, 1800-2250 m, 13 Jan 1975, *McVaugh 25754* (MICH). Sinaloa: Mpio. Concordia, "El Palmito a 9 km al oeste, bosque mesófilo con dominancia de *Pinus* - *Abies*," 17 Nov 1984, *Magallanes 180* (TEX); just W of El Palmito, pine forest in deep barranca, ca. 7000 ft, 12 Mar 1980, *Lehto 24334* (TEX); ca. 8 km al Oeste del Palmito, ca. 2350 m, 19 Nov 1984, *Vega 1439* (TEX); 1 mi S of El Palmito, Rancho Liebre Barranca, 1 mi W of highway 40, 7000 ft, 28 Dec 1983, *Sanders 4383* (TEX).

As noted, the type of this taxon was probably collected by Seemann near the village of El Palmito, Sinaloa, for his route to Cd. Durango in 1849 passed through or near this village (cf. Turner 1992, for a map of Seeman's journey from Mazatlán to Cd. Durango). Eastward from El Palmito, along present day highway 40, the first populations of *P. cronquistiorum* appear about 30 km after crossing the Durango border (Fig. 1). So far as known, Seemann did not collect the latter species; at the time of his journey (December, 1849) the portion from El Salto to Cd. Durango was relatively dry and cold.

Psacalum cronquistiorum apparently forms the occasional hybrid with *P. sinuatum* (Cerv.) H. Robins. & Brett., putative F_1 hybrids of which superficially resemble *P. pachyphyllum*, to judge from *Sundberg 2889a* (TEX) which was found growing with *P. sinuatum* (*Sundberg 2893*, TEX) and *P. cronquistiorum* (*Sundberg 2889*, TEX). While the lobing of basal leaves on the putative

hybrid are remarkably similar to *P. pachyphyllum* (as might be expected), the secondary leaves and capitulescence are quite different, the latter having numerous subfasciculate heads on short, bracteate, ultimate peduncles.

Pippen (1968) apparently examined only the phototypes of *Psacalium pachyphyllum*; all of the other specimens cited by him (7 collections from Durango) belong to *P. cronquistiorum*. The collections from Sinaloa, Nayarit, and Jalisco, cited above, have been assembled since his study. Thus, one can appreciate his failure to distinguish the populations concerned.

Psacalium pentaflorum B. Turner, *sp. nov.* TYPE: MEXICO. Jalisco: Mountains 12-15 mi SSE of Autlán, on lumber road to Corralitos, 4-10 mi above Ahuacapán in pine forest zone, ca. 1500-2200 m, 22-23 Nov 1959, *Rogers McVaugh & W.N. Koelz 919* (HOLOTYPE: LL!; Isotype: MICH!).

Psacaho eriocarpo (S.F. Blake) S.F. Blake similis sed capitulescentia capitula numerosiores efferenti, quodque capitulum flosculos tantum 5-6 (vs. 10-12) ferens, pedunculis ultimis brevioribus (plerumque 5-10 mm longis vs. 15-60 mm), et involucris bracteis 5 (vs. 8) differt.

Acaulescent perennial herbs 0.7-2.0 m high. Stems moderately puberulous-hispid (upper portions) to rather densely pilose-puberulent (lower portions). Leaves peltate, the blades round in outline, mostly 10-30 cm across with 8-12 major lobes, the latter usually sublobate with 2-3 lobules, sparsely puberulous beneath, especially along the veins. Heads numerous in elongate, relatively narrow, corymbose panicles, the ultimate peduncles mostly 5-10 mm long. Involucres cylindric at anthesis, minutely hispidulous, especially below; bracts 5, mostly 5-8 mm long, linear lanceolate to narrowly elliptic. Disk florets mostly 5 per head, less often 6; corollas white, ca. 8 mm long, the tube ca. 4.5 mm long. Achenes fusiform, ca. 4 mm long, densely pubescent; pappus of numerous white bristles 6-8 mm long.

ADDITIONAL SPECIMENS EXAMINED: MEXICO. Jalisco: 3 km W of La Cumbre, 1950-2100 m, 5 Jan 1974, *Illis 1219* (MICH, WIS); Sierra Manantlán, 2-4 km, WNW of Estación Biológica "Las Joyas," 1900-1950 m, *Judzewicz 4753* (TEX, WIS), 1200 m, 6 Nov 1971, *Luna 2168* (TEX); Sierra Manantlán, Cuautitlán, 1800 m, 18 Jan 1975, *Luna 5585* (MICH); 6-7 road miles NW of San Miguel de la Sierra, 1900-2000 m, 4 Nov 1962, *McVaugh 22059* (MICH); 15-20 mi SE of Autlán, ca. 1700 m, 7 Nov 1952, *McVaugh 13954* (MICH); Sierra de Cuale, SW of Talpa de Allende, 1800-2250 m, 19-21 Nov 1952, *McVaugh 14287* (MICH); 30-35 km SE of Autlán, 1500-1900 m, 22-23 Mar 1965, *McVaugh 23195* (MICH); 11-12 mi S of Talpa de Allende,

1200-1700 m, 18 Oct 1960, *Pippen 36* (MICH); 11-12 mi S of Talpa de Allende, 1200-1700 m, 24 Nov 1960, *Pippen 62* (MICH).

Psacalum pentaflorum is closely related to *P. eriocarpum*, but is readily distinguished from the latter by its cylindrical involucres which are composed of 5 bracts and usually contain but 5 florets (vs. 8 bracts and ca. 10 florets); in addition, the capitulescence is narrower with more numerous heads on shorter ultimate peduncles (mostly 5-10 mm long vs. 15-60 mm).

Both Pippen (1968) and McVaugh (1984) included elements which I refer to *Psacalum pentaflorum* within their concept of *Odontotrichum eriocarpum*. However, the several characters enumerated above consistently distinguish between the two taxa and in spite of the fact that populations of *P. pentaflorum* are often reportedly common (e.g., "very abundant in open pine forests," type material), in none of the sites were both taxa found growing together, nor were intergrades found.

Pippen noted that *Psacalum eriocarpum* "has two forms: the more common form has small heads with 5 phyllaries and 6 flowers, the other has larger heads with 8 phyllaries and 9-11 flowers. These two forms are similar in all other aspects, including range." I agree with most of these observations, except I also note that plants referable to *P. pentaflorum* have fewer heads on longer, more widely spreading ultimate peduncles. Clearly his smaller headed, 6 flowered forms are the same as what I call *P. pentaflorum*.

Pippen also commented upon the distributional relationships of the two above mentioned forms, noting that the "larger headed form is known only from an area in between the known populations of the smaller headed form." Fig. 2 shows the distribution of the two "forms" as determined from collections at LL, MICH, TEX, and WIS. While the two taxa appear to be sympatric, label data suggest that *Psacalum eriocarpum* mostly occurs from ca. 1700 to 2200 m, while *P. pentaflorum* occurs mostly from ca. 1200-1900 m. Future workers are urged to look closely at the characters which supposedly mark these putative species. Based upon current data, however, they are sufficiently distinct so as to suggest specific status for both.

ACKNOWLEDGMENTS

I am grateful to the Directors, University of Michigan Herbarium (MICH) and University of Wisconsin (WIS) for a complete loan of their excellent specimens, most of which served as the basis for Pippen's (1968) systematic study of *Psacalum*. Guy Nesom provided the Latin diagnoses and reviewed the paper, as did Carol Todzia.



Fig. 2. Distribution of *Psacalium eriocarpum* (solid circles) and *P. pentaflorum* (open circles).

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FLORISTICS OF FOUR SMALL BOGS IN WESTERN LOUISIANA WITH OBSERVATIONS ON SPECIES/AREA RELATIONSHIPS

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ABSTRACT

A floristic inventory of four small bogs (0.03-0.07 ha.) in the Kisatchie National Forest, Louisiana, has been done so as to compare their species richness with that of seven other larger bogs (0.4-3.0 ha.) in the same area. The smaller bogs had between 63 and 71 species per bog; the larger ones ranged from 92 to 105 species per bog. For the total sample of eleven bogs there is a clear species/area relationship in which smaller bogs have significantly fewer species. The phytogeographic implications of this are discussed.

KEY WORDS: Kisatchie National Forest, bog, island biogeography, floristics, species/area relationship, species richness

INTRODUCTION

In three previous papers we have described the floristics and soil conditions of seven hillside seepage bogs in western Louisiana (MacRoberts & MacRoberts 1988, 1990, 1991). In this paper we describe the floristic composition and soil conditions of four small hillside seepage bogs. Additionally, we compare the species/area relationship of all the bogs we have studied. The rationale for this is contained in any discussion of island biogeography in which species richness is the focus. Bogs are "habitat islands" isolated by intervening habitat of another type. For such "islands," a balance is predicted to occur between immigration and extinction that is a function of size and degree of isolation. Smaller islands have fewer species than larger islands because they are "ecologically poorer" and because extinction is higher due to the greater vulnerability of small populations. Also, the greater the degree of isolation, the fewer the number of species because of greater problems in initial colonization or recolonization after extinction (see Case & Cody 1987; Begon *et al.* 1990; Diamond & May 1976; Lack 1976; Williamson 1981, 1988).

Table 1. Soil Characteristics.

Site	pH	Exchangable Ions (ppm)					OM%
		P	K	Ca	Mg		
RCW	5.3	19	27	450	83		2.7
Robin	4.9	8	39	440	182		3.5
Vine	5.3	3	37	290	105		3.7
Sparrow	4.9	4	37	150	61		2.5

STUDY SITES/METHODS

Vine, Robin, Sparrow, and RCW bogs are located in the Kisatchie Ranger District, Kisatchie National Forest, Natchitoches Parish, Louisiana. They are located approximately 5 km east, 8.5 km northeast, 5 km northeast, and 15 km southeast of Lotus, Louisiana, and measure 0.07, 0.03, 0.04, and 0.03 ha., respectively. They are between 70 and 100 meters above sea level. All four are open with little or no canopy or midstory and are surrounded by longleaf pine woodland (Martin & Smith 1991). They occur on hillsides on slopes varying between 5 and 20 degrees. All have *Sphagnum* moss but it is not dominant in any. They occur on Kisatchie clay and Kisatchie-Oula soils (see Martin *et al.* 1990) that are saturated throughout the year. The climate is described in our previous papers and in Martin *et al.* (1990); however, 1991 was one of the wettest years in recorded history, with about 170 cm of precipitation. These four bogs are in good condition. None was burned the year previous to the study.

We visited all four bogs every other week from March to November 1991. Voucher specimens for many of the species were collected. Rare or easily identified plants were not collected. We follow MacRoberts (1984, 1989) for most scientific nomenclature. Soil samples were taken from the upper 15 cm of each bog and were analyzed by A & L Laboratories, Memphis, Tennessee.

RESULTS/DISCUSSION

In Table 1 we give soil information for the four bogs. Soils are similar among them and to the soils of the seven bogs we studied previously.

In Table 2 we list the species found in the four bogs. "V" indicates presence at Vine Bog, "R" at Robin Bog, "S" at Sparrow Bog, and "RCW" at RCW Bog. No letter indicates presence at all four bogs.

We recorded 95 taxa for these four bogs, representing 63 genera and 36 families. Vine bog had 71 taxa, Robin Bog had 63 taxa, Sparrow Bog had 61 taxa, and RCW Bog had 69 taxa. These four bogs are floristically similar.

Table 2. Taxa present.

- DENNSTAEDTIACEAE — *Pteridium aquilinum* (L.) Kuhn, (V,S,R).
 LYCOPODIACEAE — *Lycopodium alopecuroides* L.; *L. appressum* (Chapm.) Lloyd & Underw., (RCW); *L. carolinianum* L.
 OSMUNDACEAE — *Osmunda cinnamomea* L., (V,R); *O. regalis* L., (V).
 PINACEAE — *Pinus palustris* P. Mill.; *P. taeda* L., (RCW,S,R).
 AMARYLLIDACEAE — *Hypoxis rigida* Chapm.
 BURMANNIACEAE — *Burmattia capitata* (Walt.) Mart.
 CYPERACEAE — *Eleocharis tortilis* (Link) Roem. & Schult., (RCW);
Fuirena squarrosa Michx., (V,R); *Rhynchospora chalarocephala* Fern. & Gale, (R); *R. globularis* (Chapm.) Small var. *globularis*, (RCW,S,R); *R. gracilentia* A. Gray; *R. macra* (C.B. Clark) Small, (RCW,V); *R. oligantha* A. Gray, (RCW,V,S); *R. plumosa* Ell.; *R. pusilla* Chapm. ex M.A. Curtis, (R); *Scleria ciliata* Michx., (V,S); *S. georgiana* Core, (RCW); *S. reticularis* Michx.
 ERIOCAULACEAE — *Eriocaulon decangulare* L.; *Lachnocaulon anceps* (Walt.) Morong., (RCW,V,S).
 JUNCACEAE — *Juncus marginatus* Rostk., (R); *J. scirpoides* Lam., (RCW,V); *J. trigonocarpus* Steud., (RCW,V,R).
 LILIACEAE — *Aletris aurea* Walt.; *Smilax laurifolia* L.
 ORCHIDACEAE — *Calopogon tuberosus* (L.) B.S.P.; *Pogonia ophioglossoides* (L.) Juss.
 POACEAE — *Andropogon ternarius* Michx.; *Aristida virgata* Trin.; *Dicanthelium acuminatum* (Sw.) Gould & Clark; *Eragrostis spectabilis* (Pursh) Steud., (V,S); *Gymnopogon brevifolius* Trin., (RCW,R); *Muhlenbergia expansa* (Poir.) Trin., (RCW,V); *Panicum virgatum* L.; *Paspalum floridanum* Michx., (RCW,S,R); *Schizachyrium scoparium* (Michx.) Nash; *S. tenerum* Nees, (RCW,V,S); *Tridens ambiguus* (Ell.) Schultes, (RCW,V).
 XYRIDACEAE — *Xyris ambigua* Bey. ex Kunth; *X. baldwiniana* Schultes, *X. difformis* Chapm. var. *curtissii* (Malme) Kral; *X. drummondii* Malme, (V); *X. scabrifolia* Harper, (V,R); *X. torta* Smith, (RCW,S).
 ACERACEAE — *Acer rubrum* L.
 ANACARDIACEAE — *Toxicodendron radicans* (L.) Kuntze, (V,R); *T. vernix* (L.) Kuntze.
 APIACEAE — *Eryngium integrifolium* Walt.; *Oxypholis rigidior* (L.) Raf., (R); *Ptilimnium capillaceum* (Michx.) Raf., (V).
 AQUIFOLIACEAE — *Ilex coriacea* (Pursh) Chapm., (V,R); *I. opaca* Ait., (R); *I. vomitoria* Ait.
 ASTERACEAE — *Aster dumosus* L.; *Coreopsis lunifolia* Nutt.; *Eupatorium leucolepis* (DC.) Torrey & Gray; *E. rotundifolium* L.; *Helianthus angustifolius* L.; *Liatris pycnostachya* Michx.; *Marshallia graminifolia* ssp. *tenuifolia* (Raf.) Watson, (V); *Senecio tomentosus* Michx., (RCW,S,R).

CAMPANULACEAE — *Lobelia reverchonii* B.L. Turner.

CAPRIFOLIACEAE — *Viburnum nudum* L., (V).

CLUSIACEAE — *Hypericum brachyphyllum* (Spach.) Steud.; *H. crux-andreae* (L.) Crantz, (RCW,V); *H. hypericoides* (L.) Crantz, (RCW).

DROSERACEAE — *Drosera brevifolia* Pursh, (S,R); *D. capillaris* Poir.

ERICACEAE — *Rhododendron canescens* (Michx.) Sw., (R.); *Vaccinium corymbosum* L.

GENTIANACEAE — *Sabatia gentianoides* Ell.

LAURACEAE — *Persea borbonia* (L.) Spreng., (V,S).

LENTIBULARIACEAE — *Pinguicula pumila* Michx., (RCW,S), *Utricularia cornuta* Michx., (RCW,V,S); *U. juncea* Vahl. (V,S,R); *U. subulata* L.

LINACEAE — *Linum medium* (Planch.) Britt., (RCW,S).

LOGANIACEAE — *Cynoctonum sessilifolium* (Walt.) St. Hil.; *Gelsemium sempervirens* (L.) St. Hil.

MAGNOLIACEAE — *Magnolia virginiana* L.

MELASTOMATACEAE — *Rhexia mariana* L., (RCW,S); *R. petiolata* Walt., (RCW,V,S).

MYRICACEAE — *Myrica cerifera* L.; *M. heterophylla* Raf.

NYSSACEAE — *Nyssa sylvatica* Marsh.

POLYGALACEAE — *Polygala incarnata* L., (RCW).

SARRACENIACEAE — *Sarracenia alata* Wood, (V).

SCROPHULARIACEAE — *Agalinus obtusifolia* Raf., (RCW); *Gratiola neglecta* Torrey, (S); *G. pilosa* Michx., (S).

VIOLACEAE — *Viola primulifolia* L., (V).

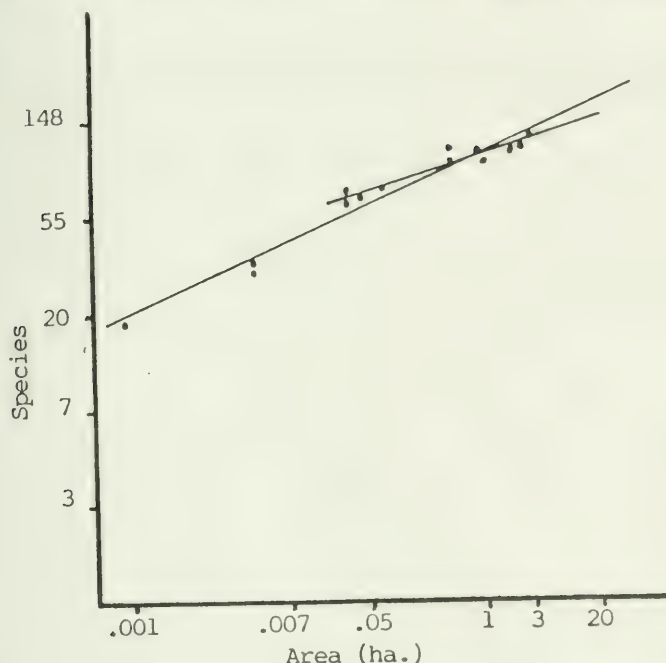


Figure 1. Species-area relationship.

Sorensen's Index of Similarity ranges from 74 to 81 among them. It ranges from 56 to 72 between them and the seven bogs we previously studied, the main reason for the difference being that the four small bogs had fewer species than the seven larger bogs.

In Figure 1 we show the species/area relationship for all eleven bogs. The seven previously studied bogs ranged from 0.4 to 3.0 ha. and had from 92 to 105 taxa. This year's bogs ranged from 0.03 to 0.07 ha. and had from 63 to 71 species. In Figure 1 are included also twelve measures that we made in 1990 on species richness in Frog Arrow and 360A Bogs (MacRoberts & MacRoberts 1991). These measures consisted of ten permanent one meter square plots (averaged in Figure 1) and two permanent twenty-five meter square plots. These data are shown to the left in the figure.

We have calculated the correlation coefficient between bog size and species richness in two ways. The first includes bogs and plots ($r = 0.97$). The other includes only bogs ($r = 0.93$). Clearly there is a strong positive relationship between bog size and number of species present. We have also calculated two species/area regression slopes. One includes plots and bogs ($z = 0.17$); the other includes only bogs ($z = 0.11$). Interestingly, these values are identical with those calculated by Williamson (1988:113) using Dony's data for open

habitats, such as bogs, in England. These habitats appear to have the lowest z values of any vascular plant community and are much lower than for other organisms.

What factors determine how many species exist in a particular bog? Is it simply a matter of size or is the answer more complex? We will make some comments but like most who have considered the species/area problem, we are unable to provide definitive answers; in fact, the whole of biogeography appears to be in a state of transition: no theory handles much data comfortably. Further, the analogy between our work on bogs and classical island biogeography must break down because there is no "mainland," only an archipelago of bogs — unless the large bogs of the gulf coastal plain, that is, northwest Florida, south Alabama, south Mississippi, and southeastern Louisiana, are to be considered the mainland. If this is entertained, then far too little is known about the mainland to make comparisons with the "islands" profitable. But our intention is not to press the analogy, but to use it insofar as it aids understanding.

Of the eleven bogs we have studied, ten are in the Kisatchie Ranger District. These ten are within about 13 km of each other and there are many other bogs scattered through the area. Strange Road Bog is in the Winn Ranger District, 55 km to the northeast (MacRoberts & MacRoberts 1988) and is not joined to the others by intervening bogs but is separated by the Red River and its flood plain. Also, there are no other bogs in the vicinity of Strange Road Bog: bog habitat appears to have been extremely limited in this part of Louisiana (Martin & Smith 1991) and is even more uncommon today. Nevertheless, although isolated, this bog is not floristically distinct from the others we have studied. It has the expected number of species, and there is nothing unusual about the species present as measured by Sorensen's Index of Similarity. This finding would suggest, at least for this instance, that isolation is not an important factor. Apparently, species in this habitat persist over long periods with little or no extinction, a finding made by others (*e.g.*, Jehl 1984).

Figure 1 can be interpreted in two ways. First, as the area of a bog increases, it gains species. Second, after reaching about one hectare, bogs do not gain additional species. Our data do not distinguish between these possibilities. Of 144 bogs in the Kisatchie Ranger District and on adjacent private land that we have surveyed, the largest is about 4.0 ha., the average is about 0.9 ha., and the modal is about 0.4 ha. Thus, we have floristic surveys over the range. Much larger bogs occur in the Vernon Ranger District about 50 km south of our study area, and, although there are no floristic surveys of these bogs, they appear to be floristically richer than those in our survey since they represent the northern limit for a number of species.

It has become obvious to us in the course of our work on bogs that bogs are not uniform habitat. They are patchy, and the larger the bog the greater

the number of microhabitats. For example, some areas in a typical bog are relatively "dry" with exposed sand while others are deep organic muck, and the two areas often support very different species. Smaller bogs are more homogeneous and consequently are less rich.

Clearly, while bogs fit the species/area relationship predicted by theory, the reasons they do so are not entirely clear. This is not a particularly surprising conclusion in light of the conflicting results obtained by numerous biogeographers over the past three decades. As Case & Cody (1987) comment, not one but many models may be required to explain patterns of species richness.

ACKNOWLEDGMENTS

We thank the staff of the Kisatchie National Forest for their continued help with our work. Robert Kral, Vanderbilt University, vetted many of our collections, and the results of his assistance are partly contained in the Appendix. D.T. MacRoberts came to our aid in statistical matters. Both made comments on the paper, which greatly improved it.

APPENDIX

We take this opportunity to correct taxonomic mistakes in our previous papers. All *Paspalum laeve* Michx. should be *P. floridanum* Michx. *Schizachyrium scoparium* (Michx.) Nash reported for Woodcock Bog should be *S. tenerum* Nees. *Andropogon gerardi* Vitman should be *Schizachyrium scoparium* (Michx.) Nash. *Xyris drummondu* Malme does not occur in Frog Arrow Bog or 360A Bog. *Hedyotis uniflora* (L.) Lam. should be *Diodia virginiana* L. All *Hypericum fasciculatum* Lam. are *H. brachyphyllum* (Spach.) Stud. All reported *Aster ericoides* L. are *A. dumosus* L. *Aster dumosus* should be added to the species occurring at Woodcock Bog. *Xyris juncea* L.C. Rich occurs at Strange Road Bog.

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NEW COMBINATIONS IN *PYRROCOMA* (ASTERACEAE: ASTEREAE)

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ABSTRACT

Seven new combinations in *Pyrrocoma* are proposed to provide a complete, formal nomenclature for the genus.

KEY WORDS: Asteraceae, Astereae, *Pyrrocoma*, *Haplopappus*, North America

We plan to treat *Pyrrocoma* as a genus distinct from *Haplopappus* in upcoming floristic treatments. Mayes (1976) in an unpublished dissertation prepared a revision of *Pyrrocoma*, but did not validate any of the nomenclatural changes he proposed. Combinations are not available in *Pyrrocoma* for several taxa we plan to recognize. We therefore propose the following new combinations to provide a complete, formal nomenclature for the genus. See Kartesz & Gandhi (1991) for additional nomenclatural changes in *Pyrrocoma*.

***Pyrrocoma carthamoides* Hook. var. *subsquarrosa* (E. Greene) G. Brown & Keil, *comb. nov.* BASIONYM: *Pyrrocoma subsquarrosa* E. Greene, *Erythea* 3:22. 1895. TYPE: UNITED STATES. Wyoming: Park Co., Sunlight Basin, 5 Sep 1893, *Rose 334* (HOLOTYPE: US; Isotype: UC).**

***Pyrrocoma clementis* Rydb. var. *villosa* (Rydb.) Mayes ex G. Brown & Keil, *comb. nov.* BASIONYM: *Pyrrocoma villosa* Rydb., *Bull. Torrey Bot. Club* 27:625. 1900. TYPE: UNITED STATES. Wyoming: Sheridan Co., Willow Creek, Big Horn Mts., Aug 1899, *Tweedy 2063* (HOLOTYPE: NY).**

Pyrrocoma crocea (A. Gray) E. Greene var. **genuflexa** (E. Greene) Mayes ex G. Brown & Keil, *comb. nov.* BASIONYM: *Pyrrocoma genuflexa* E. Greene, Pittonia 3:348. 1898. TYPE: UNITED STATES. Arizona: Coconino Co., near Flagstaff, 5 Sep 1894, *Toumey 25* (HOLOTYPE: NDG; Isotype: UC).

Pyrrocoma hirta (A. Gray) E. Greene var. **lanulosa** (E. Greene) Mayes ex G. Brown & Keil, *comb. nov.* BASIONYM: *Pyrrocoma lanulosa* E. Greene, Leaflet Bot. Observ. Crit. 2:16. 1909. TYPE: UNITED STATES. Oregon: Lake Co., Bear Flat, 18 Aug 1894, *Leiberg 748* (HOLOTYPE: US; Isotypes: F,GH,MO,NY,UC).

Pyrrocoma lanceolata (Hook.) E. Greene var. **subviscosa** (E. Greene) Mayes ex G. Brown & Keil, *comb. nov.* BASIONYM: *Pyrrocoma subviscosa* E. Greene, Proc. Acad. Nat. Sci. Philadelphia 1895:549. 1896. TYPE: UNITED STATES. Nevada: Elko Co., near Humboldt Wells, 25 Jul 1893, *Greene s.n.* (HOLOTYPE: NDG; Isotype: UC).

Pyrrocoma racemosa (Nutt.) Torrey & A. Gray var. **congesta** (E. Greene) Mayes ex G. Brown & Keil, *comb. nov.* BASIONYM: *Pyrrocoma congesta* E. Greene, Pittonia 3:23. 1896. TYPE: UNITED STATES. Oregon: Josephine Co., W base of Coast Mts. near Waldo, Sep 1892, *Howell 1438* (HOLOTYPE: NDG; Isotypes: NY,UC).

Pyrrocoma racemosa (Nutt.) Torrey & A. Gray var. **sessiliflora** (E. Greene) Mayes ex G. Brown & Keil, *comb. nov.* BASIONYM: *Pyrrocoma sessiliflora* E. Greene, Leaflet Bot. Observ. Crit. 2:11. 1909. TYPE: UNITED STATES. Nevada: Nye Co., Twin springs, 1898, *Purpus 6340* (HOLOTYPE: US; Isotypes: NY,PH,UC).

ACKNOWLEDGMENTS

We thank Dr. Ron Hartman, Dr. Bob Dorn, and Dr. W. Dennis Clark for their review and comments on the manuscript.

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A NEW SPECIES OF *PERYMENIUM* (ASTERACEAE - HELIANTHEAE)
FROM TAMAULIPAS, MEXICO

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ABSTRACT

A new species, *Perymenium yanezii* B. Turner, is described from northeastern México. It is closely related to *P. hintoniorum* and *P. tamaulipense*, both from the same region, but differs from these in possessing subelliptic, nearly entire, leaves with densely strigillose undersurfaces.

KEY WORDS: Asteraceae, *Perymenium*, México

Routine identification of Mexican Asteraceae has revealed the following novelty.

Perymenium yanezii B. Turner, *sp. nov.* TYPE: MEXICO. Tamaulipas: Mpio. de Tula, "ejido Ricardo García O Lapresita km 66 carr. Victoria-Tula ... vegetación secundaria en un Cerro Quemado. Veg. Original: Bosque de Pinos.", ca. 1550 m, 19 Oct 1985, *Manuel Yanez 616* (HOLOTYPE: TEX).

Perymenio mendezii DC. var. *angustifolio* (Brandeg.) Fay similis sed differt habitu herbaceo suffruticoso usque ad 1 m alto (vs. fruticoso vel fruticuloso 1-2 m alto) et foliis fere integris majoribus (ad medium caulium plerumque 5-6 longis vs. 2-5 cm) ac ellipticiovatis ad medium latissimis (vs. ovatis ad basim latissimisque).

Perennial suffruticose herbs to 1 m high. Stems rounded to somewhat 4-sided, sparsely appressed strigose. Leaves mostly opposite (becoming alternate at the capitulescence), 4-6 cm long, 2-3 cm wide; petioles strigose, 3-6 mm long; blades ovate-elliptic, somewhat bicolored, widest at or near the middle, sparsely strigose above, densely and evenly white strigose beneath, trinervate

from just above the obtuse base, the margins entire or nearly so. Heads 10-15 to a stem, arranged in paniculate cymes (not at all subfasciculate), the ultimate penduncles strigose, mostly 1-3 cm long. Involucres campanulate, 6-10 mm wide (in fruit), ca. 5 mm high, the bracts broadly ovate, 2-3 seriate, graduate, strigillose, grading into the receptacular chaff, the interior bracts acute, inconspicuously ciliate if at all. Receptacular bracts linear-lanceolate, scarious, the medial nerve extending into a short mucro. Ray florets pistillate, fertile, the rays ca. 8, the ligules yellow, 3-5 mm long, 2-3 mm wide. Disc florets 30-40, the corollas yellow, 4-5 mm long, the tube ca. 1 mm long, the lobes ca. 0.5 mm long. Achenes ca. 3 mm long, ca. 2 mm wide, hispidulous; pappus of 15-20 readily deciduous setae, 0.5-3.0 mm long.

This species superficially resembles *Perymenium mendezii* var. *angustifolium* from southern Puebla and closely adjacent Oaxaca but differs in being a suffruticose herb having larger, nearly entire, leaves which are densely and evenly strigose beneath. *Perymenium yanezii* actually appears closest to the recently described *P. hintoniorum* B. Turner (Phytologia 71:315. 1991.) and *P. tamaulipense* B. Turner (Phytologia 63:396. 1987.), both of the latter being suffruticose herbs 40-100 cm high. *Perymenium yanezu* differs from *P. hintoniorum* and *P. tamaulipense* in having ovate-elliptic, nearly entire, leaves which are densely and evenly strigose beneath (vs. hispidulous with coarse erect hairs).

ACKNOWLEDGMENTS

I am grateful to Guy Nesom for the Latin diagnosis and to him and J. Soule for reviewing the manuscript.

A NEW SPECIES OF *NAMA* FROM THE CUATRO CIENEGAS AREA OF COAHUILA, MEXICO

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ABSTRACT

Nama cuatrocienegense, *sp. nov.*, apparently is endemic to the vicinity of Cuatro Cienegas, Coahuila, in the Chihuahuan Desert Region of México. It is most closely related to *N. serpylloides*, *N. rzedowskii*, and *N. parvifolium*.

KEY WORDS: *Nama*, Hydrophyllaceae, México, Chihuahuan Desert

General curation at LL,TEX and identification of recent collections has revealed the existence of a previously undescribed species of *Nama*.

Nama cuatrocienegense Nesom, *sp. nov.* TYPE: MEXICO. Coahuila: Mpio. Cuatro Cienegas, slopes of Sierra San Marcos y Pinos, from Cuatro Cienegas 27 km SW on Hwy 30 then 14 km SE, locally abundant on gravelly terraces, 29 Mar 1992, *J.L. Neff 92-3-29-1* (HOLOTYPE: TEX!; Isotype: MEXU!).

Namati serpylloidi Hemsley ac *N. parvifolio* (Torr.) Greenm. similis morphologia seminum et foliis oppositis vel suboppositis, ab uterque differt duratione annua et statura minore; differt a *N. serpyllode* pedicellis fructiferis sigmoideis; differt a *N. parvifolio* foliis omnino oppositis.

Annuals, apparently quickly ephemeral, with erect to ascending erect stems 3-8 cm long, the stems, leaves, and calyx with a mixture of stipitate-glands and stiffly spreading, eglandular hairs 0.1-0.4 mm long. Leaves opposite throughout, thin, essentially petiolate, obovate to somewhat spatulate, with broadly involute to nearly flat margins, 5-9 mm long, 2-4(-5) mm wide. Flowers in 2's or 3's in the leaf axils; pedicels filiform, 5-12 mm long, strongly recurved-sigmoid at maturity and bearing erect fruits; sepals free to the base, (3.5-)4.5-6.0 mm

long, linear to linear-lanceolate, apically acute; corollas 7-8 mm long, weakly funnelform-salverform, the tube yellow, the lobes bluish; filaments 2.2-3.0 mm long, the free portions about 2 times longer than the narrowly winged, adnate portions; styles 2.2-2.5 mm long. Fruits (capsules) 2.5-3.2 mm long; seeds slightly ovoid, brown, with reticulate surfaces.

Additional collection examined: MEXICO. Coahuila: Sierra de la Fragua, 25 mi S of Cuatro Ciénegas along Hwy 30, N-facing slope of 30%, 2400 ft, 22 Mar 1975, Venable & McCormick 769 (LL).

Nama cuatrociénegense is distinctive in its combination of the following features: annual duration, small stature, thin, completely opposite leaves with broadly involute margins, sigmoid fruiting pedicels, and reticulate seed surfaces. The seed morphology of the new species is identical to that of *N. serpylloides* and *N. rzedowskii* Bacon (members of seed "Group 5" of Chance & Bacon 1984) and nearly so to that of *N. parvifolium*. Further, the leaves of *N. serpylloides* and *N. rzedowskii*, like those of the new one, are opposite from the stem base to tip, and *N. parvifolium* tends to produce opposite leaves toward the stem apices. These are the only species in the genus with opposite leaves, the margins of which commonly are involute, and with the similarity in seed morphology, it is clear that they form a monophyletic group (Hitchcock 1939; Bacon 1981; Chance & Bacon 1984).

Among the three close relatives of *Nama cuatrociénegense*, only *N. rzedowskii* is annual, but it differs from the new species in its shorter and relatively straight pedicels and much shorter calyces, corollas, and styles. *Nama serpylloides* produces short styles like those of the new species but the former is easily distinguished by its velvety vestiture and perennial duration. *Nama parvifolium* produces a vestiture similar to that of *N. cuatrociénegense* as well as strongly sigmoid fruiting pedicels, the latter a very distinctive feature that perhaps marks these two species as sister taxa.

Both collections of *Nama cuatrociénegense* were made from localities on the southern edge of the Cuatro Ciénegas basin. *Nama parvifolium* occurs well to the east and northeast of Cuatro Ciénegas in Tamaulipas, Nuevo León, and south Texas, primarily outside of the Chihuahuan Desert Region; *N. rzedowskii* is endemic to the gypsum plains around Río Verde, San Luis Potosí. Two varieties of *N. serpylloides* (var. *serpylloides* and var. *confertum* I.M. Johnston) have been recorded for the area of Cuatro Ciénegas (Pinkava 1976). *Nama serpylloides* var. *velutinum* C.L. Hitchc. (1939) was described from plants in the vicinity of Cuatro Ciénegas and appears to be the earliest name for the same entity as *N. serpylloides* var. *confertum*. The new species is compared in the diagnosis to the two species of northeastern México, its closest relatives geographically.

ACKNOWLEDGMENTS

I thank Dr. B.L. Turner and Dr. L.A. Escobar for their review of the manuscript.

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PUBLICATION DATES FOR VOLUME 72

Volume 72(1): Date on title page-January 1992; Date of mailing-10 April 1992.

Volume 72(2): Date on title page-February 1992; Date of mailing-13 May 1992.

Volume 72(3): Date on title page-March 1992; Date of mailing-27 May 1992.

Volume 72(4): Date on title page-April 1992; Date of mailing-3 July 1992.

Volume 72(5): Date on title page-May 1992; Date of mailing-16 July 1992.

Volume 72(6): Date on title page-June 1992; Date of mailing-30 July 1992.



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